



SAFETY DATA SHEET

DISODIUM TETRABORATE PENTAHYDRATE

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

1.1. Product identifier

Product name	DISODIUM TETRABORATE PENTAHYDRATE
Product number	20324
Synonyms; trade names	FERTIBOR, NEOBOR, GRANUBOR, ETIBOR, BORAX 5-HYDRAT GRANULAT, NEOBOR BORAXS PENTAHYDRATE, BORAXS PENTAHYDRATE GRANULATE, BORATE ME7 TKE, GRANUBOR NATUR, NEOBOR - TECHNICAL
REACH registration number	01-2119490790-32-XXXX
CAS number	12179-04-3
EU index number	005-011-02-9
EC number	215-540-4

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

Identified uses	Binding Agent Chemicals used in the synthesis and / or formulation of industrial products Complexing Agent Corrosion inhibitor. Anti Scaling agent Fertilizer Flame retardant Chemical Intermediate Flux agents for casting Chemical Intermediate Laboratory reagent. Lubricant. Oxidising agents. Photosensitive agents and other photo chemicals pH control plating agents and metal surface treating agents Process regulator Process Additive Surface active agents Viscosity modifiers For further information, see attached Exposure Scenario.
Uses advised against	Consumer

1.3. Details of the supplier of the safety data sheet

DISODIUM TETRABORATE PENTAHYDRATE

Supplier Univar Solutions UK Ltd
Aquarius House
6 Mid Point Business Park
Bradford
BD3 7AY
+44 1274 267300
+44 1274 267306
SDS.EMEA@univarsolutions.com

1.4. Emergency telephone number

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

Sds No. 20324

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Not Classified
Health hazards Eye Irrit. 2 - H319 Repr. 1B - H360FD
Environmental hazards Not Classified

2.2. Label elements

EC number 215-540-4

Hazard pictograms



Signal word Danger

Hazard statements H319 Causes serious eye irritation.
H360FD May damage fertility. May damage the unborn child.

Precautionary statements 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.
P405 Store locked up.
P501 Dispose of contents/ container in accordance with national regulations.

Supplemental label information RCH002a Restricted to professional users.

2.3. Other hazards

Pregnant or breastfeeding women should not work with this product if there is any risk of exposure.
This substance is not classified as PBT or vPvB according to current EU criteria.
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1. Substances

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REACH registration number	01-2119490790-32-XXXX
EU index number	005-011-02-9
CAS number	12179-04-3
EC number	215-540-4
Ingredient notes	Acute Toxicity Estimate (oral): > 2000 - < 5000 mg/kg Acute Toxicity Estimate (dermal): > 2000 mg/kg Acute Toxicity Estimate (inhalation): > 2 mg/l 4 hours
Composition comments	The data shown are in accordance with the latest EC Directives.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information	First aid personnel should wear appropriate protective equipment during any rescue. Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk.
Inhalation	Move affected person to fresh air at once. Rinse nose and mouth with water. Get medical attention if any discomfort continues.
Ingestion	Rinse mouth thoroughly with water. Do not induce vomiting. Give a few small glasses of water or milk to drink. Get medical attention.
Skin contact	Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues.
Eye contact	Remove any contact lenses and open eyelids wide apart. Continue to rinse for 30 minutes. Get medical attention if any discomfort continues.

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

General information	May damage fertility. May damage the unborn child.
Inhalation	Dust in high concentrations may irritate the respiratory system. Symptoms following overexposure may include the following: Respiratory system irritation. Coughing.
Ingestion	Symptoms following overexposure may include the following: Nausea, vomiting. Diarrhoea. Effects may be delayed. Skin irritation. Redness. Dryness and/or cracking.
Skin contact	Symptoms following overexposure may include the following: Nausea, vomiting. Diarrhoea. Effects may be delayed. Skin irritation. Redness. Dryness and/or cracking.
Eye contact	Causes serious eye irritation. Symptoms following overexposure may include the following: Irritation. Redness. Profuse watering of the eyes.

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

Notes for the doctor	Treat symptomatically. Contact specialist immediately poison treatment if large quantities have been ingested or inhaled
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	The product is not flammable. The product is non-combustible. Use fire-extinguishing media suitable for the surrounding fire.
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Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards None known.

Hazardous combustion products Heating may generate the following products: Borates ($\text{Na}_2\text{B}_4\text{O}_7$)

5.3. Advice for firefighters

Protective actions during firefighting No action shall be taken without appropriate training or involving any personal risk. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Control run-off water by containing and keeping it out of sewers and watercourses. Contain and collect extinguishing water. Evacuate area.

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions No action shall be taken without appropriate training or involving any personal risk. Follow precautions for safe handling described in this safety data sheet. Keep unnecessary and unprotected personnel away from the spillage. Provide adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Do not touch or walk into spilled material. Pregnant or breastfeeding women should not work with this product if there is any risk of exposure.

6.2. Environmental precautions

Environmental precautions Avoid the spillage or runoff entering drains, sewers or watercourses. Avoid or minimise the creation of any environmental contamination. Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Approach the spillage from upwind. Avoid generation and spreading of dust. Avoid the spillage or runoff entering drains, sewers or watercourses. Remove spillage with vacuum cleaner or collect with a shovel and broom, or similar. Label the containers containing waste and contaminated materials and remove from the area as soon as possible.

6.4. Reference to other sections

Reference to other sections Wear protective clothing as described in Section 8 of this safety data sheet. Collect and dispose of spillage as indicated in Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Handle all packages and containers carefully to minimise spills. Wear protective clothing as described in Section 8 of this safety data sheet. Pregnant or breastfeeding women should not work with this product if there is any risk of exposure. Avoid handling which leads to dust formation. Provide adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid inhalation of dust and contact with skin and eyes.

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Advice on general occupational hygiene

Do not eat, drink or smoke when using this product. Wash at the end of each work shift and before eating, smoking and using the toilet. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. Provide eyewash station and safety shower. Remove contaminated clothing and protective equipment before entering eating areas. Contaminated work clothing should not be allowed out of the workplace. Take off contaminated clothing and wash it before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions

Store in tightly-closed, original container in a dry, cool and well-ventilated place. Protect from moisture. Do not store near heat sources or expose to high temperatures.
Store away from the following materials: Strong reducing agents. Inorganic hydrides. Alkali metals.

7.3. Specific end use(s)

Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Occupational exposure limits

Long-term exposure limit (8-hour TWA): WEL 1 mg/m³

WEL = Workplace Exposure Limit.

DNEL

Workers - Inhalation; Long term local effects: 17.04 mg/m³
Workers - Inhalation; Short term local effects: 17.04 mg/m³
Workers - Inhalation; Long term systemic effects: 9.8 mg/m³
Workers - Dermal; Long term systemic effects: 458.2 mg/kg/day
General population - Inhalation; Short term local effects: 17.04 mg/m³
General population - Oral; Short term systemic effects: 1.15 mg/kg/day
General population - Inhalation; Long term local effects: 17.04 mg/m³
General population - Oral; Long term systemic effects: 1.15 mg/kg/day
General population - Inhalation; Long term systemic effects: 4.9 mg/m³
General population - Dermal; Long term systemic effects: 231.8 mg/kg/day
General population - Oral; Long term systemic effects: 0.79 mg/kg/day
General population - Inhalation; Long term systemic effects: 3.4 mg/m³
Workers - Inhalation; Long term systemic effects: 6.7 mg/m³
General population - Dermal; Long term systemic effects: 159.5 mg/kg/day
Workers - Dermal; Long term systemic effects: 316.4 mg/m³

PNEC

Fresh water; 2.9 mg B/L
marine water; 2.9 mg B/L
Water, Intermittent release; 13.7 mg B/L
Soil; 5.7 mg B/L
STP; 10 mg B/L

8.2. Exposure controls

Protective equipment



Appropriate engineering controls

Provide adequate general and local exhaust ventilation. Observe any occupational exposure limits for the product or ingredients. Use process enclosures, local exhaust ventilation or other engineering controls as the primary means to minimise worker exposure. Avoid inhalation of dust and contact with skin and eyes. Provide eyewash station and safety shower.

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Eye/face protection	Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Personal protective equipment for eye and face protection should comply with European Standard EN166. Unless the assessment indicates a higher degree of protection is required, the following protection should be worn: Chemical splash goggles.
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. To protect hands from chemicals, gloves should comply with European Standard EN374. The selected gloves should have a breakthrough time of at least 8 hours. The most suitable glove should be chosen in consultation with the glove supplier/manufacture, who can provide information about the breakthrough time of the glove material. Frequent changes are recommended.
Other skin and body protection	Wear appropriate clothing to prevent repeated or prolonged skin contact.
Hygiene measures	Do not eat, drink or smoke when using this product. Wash at the end of each work shift and before eating, smoking and using the toilet. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. Remove contaminated clothing and protective equipment before entering eating areas. Take off contaminated clothing and wash it before reuse. Contaminated work clothing should not be allowed out of the workplace.
Respiratory protection	Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Protection against nuisance dust must be used when the airborne concentration exceeds 10 mg/m ³ . Ensure all respiratory protective equipment is suitable for its intended use and is 'CE'-marked. If ventilation is inadequate, suitable respiratory protection must be worn. Wear a respirator fitted with the following cartridge: Particulate filter, type P2.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Crystalline solid.
Colour	White.
Odour	Odourless.
Odour threshold	No information available.
pH	pH (diluted solution): 9.23 @ 3.5% aq
Melting point	> 300°C
Initial boiling point and range	No information available.
Flash point	No information available.
Evaporation rate	No information available.
Evaporation factor	No information available.
Flammability (solid, gas)	The product is non-combustible.
Upper/lower flammability or explosive limits	No information available.
Other flammability	No information available.
Vapour pressure	No information available.
Vapour density	No information available.
Relative density	1.72 @ 23°C

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Bulk density	No information available.
Solubility(ies)	Soluble in water. 49.74 g/l water @ 20°C
Partition coefficient	log Pow: -0.757 to -1.53
Auto-ignition temperature	No information available.
Decomposition Temperature	No information available.
Viscosity	No information available.
Explosive properties	Not considered to be explosive.
Explosive under the influence of a flame	No information available.
Oxidising properties	Does not meet the criteria for classification as oxidising.

9.2. Other information

Molecular weight	291.35 g/mol
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SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	No test data specifically related to reactivity available for this product or its ingredients.
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10.2. Chemical stability

Stability	Stable at normal ambient temperatures and when used as recommended. Heating may generate the following products: Water Na ₂ B ₄ O ₇
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10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	The following materials may react with the product: Strong reducing agents. Inorganic hydrides. Alkali metals. Some hydrogen gas may be released. Hydrogen is flammable and can form explosive mixtures with air.
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10.4. Conditions to avoid

Conditions to avoid	Avoid excessive heat for prolonged periods of time. Protect from moisture.
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10.5. Incompatible materials

Materials to avoid	Avoid contact with the following materials: Strong reducing agents. Inorganic hydrides. Alkali metals.
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10.6. Hazardous decomposition products

Hazardous decomposition products	Does not decompose when used and stored as recommended. No known hazardous decomposition products. Thermal decomposition or combustion products may include the following substances: (Na ₂ B ₄ O ₇)
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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg)	3,305.0
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Species	Rat
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Notes (oral LD₅₀)	LD ₅₀ 3305 mg/kg, Oral, Rat
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ATE oral (mg/kg)	3,305.0
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Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ > 2000 mg/kg, Dermal, Rabbit

Acute toxicity - inhalation

Acute toxicity inhalation (LC₅₀ gases ppmV) 2.12

Notes (inhalation LC₅₀) LC₅₀ (4d) >2 mg/l, Inhalation, Dust/Mist, Rat

Skin corrosion/irritation

Skin corrosion/irritation Not irritating. Rabbit

Serious eye damage/irritation

Serious eye damage/irritation Causes serious eye irritation. Rabbit Fully reversible within 14 days.

Respiratory sensitisation

Respiratory sensitisation Based on available data the classification criteria are not met.

Skin sensitisation

Skin sensitisation Guinea pig maximization test (GPMT) - Guinea pig: Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro Bacterial reverse mutation test: Negative. Read-across data. Boric acid

Genotoxicity - in vivo Based on available data the classification criteria are not met.

Carcinogenicity

Carcinogenicity Based on available data the classification criteria are not met. Negative., Dose level: 446 - 1150 mg/kg/day, Boric acid, Oral, Mouse

Reproductive toxicity

Reproductive toxicity - fertility May damage fertility.
Fertility, Multi-generation study - NOAEL 17.5 mg B/kg , Oral, Rat, Male

Reproductive toxicity - development May damage the unborn child.
Developmental toxicity: - NOAEL: 9.6 mg B/kg , Oral, Rat
Maternal toxicity: - NOAEL: 13.3 mg B/kg , Oral, Rat

Specific target organ toxicity - single exposure

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

Specific target organ toxicity - repeated exposure

STOT - repeated exposure Based on available data the classification criteria are not met. Chronic, NOAEL (2yr) 17.5 mg B/kg/day , Oral, Rat, Male reproductive organs

Aspiration hazard

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

Toxicokinetics

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Inhalation

Dust in high concentrations may irritate the respiratory system. Symptoms following overexposure may include the following: Respiratory system irritation. Coughing.

Ingestion

The product is considered to be a low hazard under normal conditions of use. No harmful effects expected from quantities likely to be ingested by accident. May cause discomfort if swallowed. Symptoms following overexposure may include the following: Nausea, vomiting. Diarrhoea. Effects may be delayed. Skin irritation. Redness. Dryness and/or cracking.

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Skin contact	Symptoms following overexposure may include the following: Nausea, vomiting. Diarrhoea. Effects may be delayed. Skin irritation. Redness. Dryness and/or cracking.
Eye contact	Causes serious eye irritation. Symptoms following overexposure may include the following: Irritation. Redness. Profuse watering of the eyes.
Acute and chronic health hazards	May damage fertility. May damage the unborn child.

SECTION 12: Ecological information

Ecotoxicity	Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.
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12.1. Toxicity

Acute aquatic toxicity

Acute toxicity - fish	Acute, LC ₅₀ , : 79.7 mg/l, Pimephales promelas (Fat-head Minnow) Read-across data. Boron. Chronic, NOEC, : 6.4 mg/l, Brachydanio rerio (Zebra Fish) Read-across data. Boron.
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Acute toxicity - aquatic invertebrates	NOEC, : 14.2 mg/l, Daphnia magna Read-across data. Boron. LC ₅₀ , : 91 mg/l, Ceriodaphnia dubia Read-across data. Boron.
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Acute toxicity - aquatic plants	Acute, EC ₅₀ , : 52.4 mg/l, Pseudokirchneriella subcapitata Read-across data. Boron. Chronic, NOEC, : 17.5 mg/l, Pseudokirchneriella subcapitata Read-across data. Boron.
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12.2. Persistence and degradability

Persistence and degradability	Not applicable. Substance is inorganic.
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12.3. Bioaccumulative potential

Bioaccumulative potential	Bioaccumulation is unlikely.
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Partition coefficient	log Pow: -0.757 to -1.53
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12.4. Mobility in soil

Mobility	The product is soluble in water.
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12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	Not applicable. Substance is inorganic.
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12.6. Other adverse effects

Other adverse effects	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
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SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information	Waste is classified as hazardous waste. Do not puncture or incinerate, even when empty. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.
Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

SECTION 14: Transport information

General	The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).
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14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Not applicable.

Annex II of MARPOL 73/78
and the IBC Code

SECTION 15: Regulatory information

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

EU legislation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended). Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended). COMMISSION REGULATION (EU) 2020/878 of 18 June 2020
Restrictions (Annex XVII Regulation 1907/2006)	CAUTION - Chemical may be subject to REACH RESTRICTIONS - see Annex XVII. This product is/contains a substance that is included in REGULATION (EC) No 1907/2006 (REACH) ANNEX XVII - RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES. Entry number: 30

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15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

Inventories

EU - EINECS/ELINCS

All the ingredients are listed or exempt.

Canada - DSL/NDSL

All the ingredients are listed or exempt.
DSL

US - TSCA

All the ingredients are listed or exempt.

Australia - AICS

All the ingredients are listed or exempt.

Japan - ENCS

All the ingredients are listed or exempt.
ENCS

Korea - KECI

All the ingredients are listed or exempt.

China - IECSC

All the ingredients are listed or exempt.

Philippines – PICCS

All the ingredients are listed or exempt.

New Zealand - NZIOC

All the ingredients are listed or exempt.

Taiwan - TCSI

All the ingredients are listed or exempt.

SECTION 16: Other information

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Abbreviations and acronyms used in the safety data sheet

ATE: Acute Toxicity Estimate.
 ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
 ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
 CAS: Chemical Abstracts Service.
 DNEL: Derived No Effect Level.
 IATA: International Air Transport Association.
 IMDG: International Maritime Dangerous Goods.
 Kow: Octanol-water partition coefficient.
 LC₅₀: Lethal Concentration to 50 % of a test population.
 LD₅₀: Lethal Dose to 50% of a test population (Median Lethal Dose).
 PBT: Persistent, Bioaccumulative and Toxic substance.
 PNEC: Predicted No Effect Concentration.
 REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.
 RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
 vPvB: Very Persistent and Very Bioaccumulative.
 IARC: International Agency for Research on Cancer.
 MARPOL 73/78: International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978.
 cATpE: Converted Acute Toxicity Point Estimate.
 BCF: Bioconcentration Factor.
 BOD: Biochemical Oxygen Demand.
 EC₅₀: 50% of maximal Effective Concentration.
 LOAEC: Lowest Observed Adverse Effect Concentration.
 LOAEL: Lowest Observed Adverse Effect Level.
 NOAEC: No Observed Adverse Effect Concentration.
 NOAEL: No Observed Adverse Effect Level.
 NOEC: No Observed Effect Concentration.
 LOEC: Lowest Observed Effect Concentration.
 DMEL: Derived Minimal Effect Level.
 EL50: Exposure Limit 50
 hPa: Hectopascal
 LL50: Lethal Loading fifty
 OECD: Organisation for Economic Co-operation and Development
 POW: Octanol-water partition coefficient
 SCBA: self-contained breathing apparatus
 STP: Sewage Treatment Plant
 VOC: Volatile Organic Compounds

Classification abbreviations and acronyms

Acute Tox. = Acute toxicity
 Aquatic Acute = Hazardous to the aquatic environment (acute)
 Aquatic Chronic = Hazardous to the aquatic environment (chronic)

Key literature references and sources for data

Supplier's information.

Classification procedures according to Regulation (EC) 1272/2008

Repr. 1B - H360FD, Eye Irrit. 2 - H319: Expert judgement.

Revision comments

NOTE: Lines within the margin indicate significant changes from the previous revision.

Revision date

02/01/2023

DISODIUM TETRABORATE PENTAHYDRATE

Version number	6.000
Supersedes date	09/11/2020
SDS number	20324
SDS status	Approved.
Hazard statements in full	H319 Causes serious eye irritation. H360FD May damage fertility. May damage the unborn child.
Signature	Jacq Pattinson

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.



Exposure scenario

Environmental exposure scenario for generic industrial use of borates resulting in the manufacture of another substance

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic industrial use of borates resulting in the manufacture of another substance
Product category	PC7 Base metals and alloys. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC24 Lubricants, greases and release products. PC25 Metal working fluids.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals

Environment

Environmental release category	ERC1 Manufacture of the substance ERC6a Use of intermediate ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article)
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 190 tonnes

Frequency and duration of use

Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.036562
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.06000

Environmental exposure scenario for generic industrial use of borates resulting in the manufacture of another substance

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 1150 tonnes

Frequency and duration of use

Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.036562

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.06000

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 100

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1956 µg/l, PNEC 2020 µg/l, RCR 0.969
Soil: Exposure 0.86 mg/kg, PNEC 5.4 mg/kg, RCR 0.158

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 1206 µg/l, PNEC 2020 µg/l, RCR 0.597
Soil: Exposure 5.15 mg/kg, PNEC 5.4 mg/kg, RCR 0.954

4. Guidance to check compliance with the exposure scenario (Environment 2)

Environmental exposure scenario for generic industrial use of borates resulting in the manufacture of another substance

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for importing, manufacturing, refining and packaging of borates

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for importing, manufacturing, refining and packaging of borates
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals

Environment

Environmental release category	ERC1 Manufacture of the substance ERC6a Use of intermediate
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid
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Amounts used

Annual amount used in the EU: 100000 tonnes

Frequency and duration of use

Emission days: 220 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.00000053
Emission factor - water	Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution	No discharge of substance into waste water.
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
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Environmental exposure scenario for importing, manufacturing, refining and packaging of borates

STP type No STP.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Water No discharge of substance into waste water.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Product characteristics

Physical state Solid

Amounts used

Annual amount used in the EU: 55000 tonnes

Frequency and duration of use

Emission days: 220 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.00000053

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.000554

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 37

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

STP type No STP.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Water No wastewater treatment required.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 0.01 mg/kg, PNEC 5.4 mg/kg, RCR 0.002

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 1872 µg/l, PNEC 2020 µg/l, RCR 0.954
Soil: Exposure 0.01 mg/kg, PNEC 5.4 mg/kg, RCR 0.002

4. Guidance to check compliance with the exposure scenario (Environment 2)

Environmental exposure scenario for importing, manufacturing, refining and packaging of borates

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic formulation of borates into materials

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic formulation of borates into materials
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC3 Formulation into solid matrix
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 1150 tonnes

Frequency and duration of use

Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.036562
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.002

Environmental factors not influenced by risk management measures

Dilution	No discharge of substance into waste water.
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Formulation activity is assumed to be a predominantly enclosed process.
STP type	Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for generic formulation of borates into materials

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1206 µg/l, PNEC 2020 µg/l, RCR 0.597
Soil: Exposure 5.15 mg/kg, PNEC 5.4 mg/kg, RCR 0.954

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic industrial use of borates as processing aids in processes and products

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic industrial use of borates as processing aids in processes and products
Main sector	SU3 Industrial uses
<u>Environment</u>	
Environmental release category	ERC2 Formulation into mixture

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 14 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.036562
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 1

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Formulation activity is assumed to be a predominantly enclosed process.
STP type	Municipal STP.

Environmental exposure scenario for generic industrial use of borates as processing aids in processes and products

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 140 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.036562

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 1

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 100

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 3)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 1150 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.036562

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 1

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 1000

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Environmental exposure scenario for generic industrial use of borates as processing aids in processes and products

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 4)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 50 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.036562

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 1

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 35

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1974 µg/l, PNEC 2020 µg/l, RCR 0.977
Soil: Exposure 0.07 mg/kg, PNEC 5.4 mg/kg, RCR 0.013

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 1974 µg/l, PNEC 2020 µg/l, RCR 0.977
Soil: Exposure 0.63 mg/kg, PNEC 5.4 mg/kg, RCR 0.117

4. Guidance to check compliance with the exposure scenario (Environment 2)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 3)

Environmental exposure scenario for generic industrial use of borates as processing aids in processes and products

Environmental exposure Fresh water: Exposure 1575 µg/l, PNEC 2020 µg/l, RCR 0.808
Soil: Exposure 5.15 mg/kg, PNEC 5.4 mg/kg, RCR 0.954

4. Guidance to check compliance with the exposure scenario (Environment 3)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 4)

Environmental exposure Fresh water: Exposure 1974 µg/l, PNEC 2020 µg/l, RCR 0.977
Soil: Exposure 0.23 mg/kg, PNEC 5.4 mg/kg, RCR 0.043

4. Guidance to check compliance with the exposure scenario (Environment 4)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic wide dispersive use of articles containing borates with high release

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic wide dispersive use of articles containing borates with high release
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC10b Widespread use of articles with high or intended release (outdoor) ERC11b Widespread use of articles with high or intended release (indoor)

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Product applied to a substrate to form a solid matrix.
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Amounts used

Annual amount used in the EU: 35000 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Not applicable for wide dispersive uses.
Emission factor - water	Release fraction to wastewater from wide dispersive use: 1

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

STP type	Municipal STP.
STP details	Assumed domestic sewage treatment plant flow: 2000 m ³ /day

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for generic wide dispersive use of articles containing borates with high release

Disposal method Not applicable for wide dispersive uses.

3. Exposure estimation (Environment 1)

Environmental exposure STP: Exposure 9589 µg/l, PNEC 10000 µg/l, RCR 0.959
Fresh water: Exposure 1015 µg/l, PNEC 2020 µg/l, RCR 0.503

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for formulation of borates into adhesives

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for formulation of borates into adhesives
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC2 Formulation into mixture
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 1000 tonnes

Frequency and duration of use

Emission days: 240 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.00005
Emission factor - water	Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution	No discharge of substance into waste water.
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Formulation activity is assumed to be a predominantly enclosed process.
STP type	Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for formulation of borates into adhesives

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 0.01 mg/kg, PNEC 5.4 mg/kg, RCR 0.002

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic wide dispersive use of articles containing borates with low release

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic wide dispersive use of articles containing borates with low release
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC10a Widespread use of articles with low release (outdoor) ERC11a Widespread use of articles with low release (indoor)

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Product applied to a substrate to form a solid matrix.
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Amounts used

Annual amount used in the EU: 1100000 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Not applicable for wide dispersive uses.
Emission factor - water	Release fraction to wastewater from wide dispersive use: 0.032

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

STP type	Municipal STP.
STP details	Assumed domestic sewage treatment plant flow: 2000 m ³ /day

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for generic wide dispersive use of articles containing borates with low release

Disposal method Not applicable for wide dispersive uses.

3. Exposure estimation (Environment 1)

Environmental exposure STP: Exposure 9644 µg/l, PNEC 10000 µg/l, RCR 0.964
Fresh water: Exposure 1021 µg/l, PNEC 2020 µg/l, RCR 0.505

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic formulation of borate into mixtures

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic formulation of borate into mixtures
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC2 Formulation into mixture
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 950 tonnes

Frequency and duration of use

Emission days: 200 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.0004
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.008

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Formulation activity is assumed to be a predominantly enclosed process.
STP type	Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for generic formulation of borate into mixtures

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 9500 tonnes

Frequency and duration of use

Emission days: 200 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.0004

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.008

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 100

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 3)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 15000 tonnes

Frequency and duration of use

Emission days: 200 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.0004

Emission factor - water Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution No discharge of substance into waste water.

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for generic formulation of borate into mixtures

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1956 µg/l, PNEC 2020 µg/l, RCR 0.969
Soil: Exposure 0.05 mg/kg, PNEC 5.4 mg/kg, RCR 0.010

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 1956 µg/l, PNEC 2020 µg/l, RCR 0.969
Soil: Exposure 0.47 mg/kg, PNEC 5.4 mg/kg, RCR 0.087

4. Guidance to check compliance with the exposure scenario (Environment 2)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 3)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 0.74 mg/kg, PNEC 5.4 mg/kg, RCR 0.137

4. Guidance to check compliance with the exposure scenario (Environment 3)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for wide dispersive use of fertilizers containing borates

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for wide dispersive use of fertilizers containing borates
Main sector	SU21 Consumer uses SU22 Professional uses
Sector of use	SU1 Agriculture, forestry, fishery

Environment

Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8c Widespread use leading to inclusion into/onto article (indoor) ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) ERC8f Widespread use leading to inclusion into/onto article (outdoor)
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
Concentration details	Covers concentrations up to 7.7 %.

Amounts used

Annual amount used in the EU: 35000 tonnes

Other given operational conditions affecting environmental exposure

Emission factor - air	Not applicable for wide dispersive uses.
Emission factor - water	Release fraction to wastewater from wide dispersive use: 1

Environmental factors not influenced by risk management measures

Dilution	Not applicable.
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Risk management measures

STP type	Not relevant.
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Environmental exposure scenario for wide dispersive use of fertilizers containing borates

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Soil	Controlled application to agricultural soil.
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Conditions and measures related to external treatment of waste for disposal

Disposal method	Not applicable for wide dispersive uses.
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3. Exposure estimation (Environment 1)

Environmental exposure	The use is assessed to be safe.
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4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic use of borates in laboratories as analytical reagent

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic use of borates in laboratories as analytical reagent
Main sector	SU3 Industrial uses SU22 Professional uses

Environment

Environmental release category	ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article) ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8b Widespread use of reactive processing aid (no inclusion into or onto article, indoor) ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) ERC8e Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Small scale

Frequency and duration of use

Emission days: 365 days/year

Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.
Technical measures	Prevent discharge of undissolved substance to or recover from onsite waste water.
STP type	Municipal STP.

Environmental exposure scenario for generic use of borates in laboratories as analytical reagent

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Qualitative approach used to conclude safe use.

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of borates for autocausticizing

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates for autocausticizing
Main sector	SU3 Industrial uses
<u>Environment</u>	
Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 0.3 tonnes

Frequency and duration of use

Continuous release.

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.036562
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.5

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
STP type	No STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method	This material and its container must be disposed of as hazardous waste.
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Environmental exposure scenario for industrial use of borates for autocausticizing

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 457 µg/l, PNEC 2020 µg/l, RCR 0.226
Soil
Qualitative approach used to conclude safe use.

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of borates in the production in the production of diboron trioxide containing catalysts

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates in the production in the production of diboron trioxide containing catalysts
Product category	PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC12 Lawn and garden preparations (- fertilizers). PC14 Metal surface treatment products PC15 Non-metal-surface treatment products. PC17 Hydraulic fluids. PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC23 Leather treatment products PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC26 Paper and board treatment products PC29 Pharmaceuticals PC30 Photochemicals. PC32 Polymer preparations and compounds. PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products PC39 Cosmetics, personal care.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals

Environment

Environmental exposure scenario for industrial use of borates in the production in the production of diboron trioxide containing catalysts

Environmental release category	ERC1 Manufacture of the substance
	ERC6a Use of intermediate
	ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article)
	ERC3 Formulation into solid matrix

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 200 tonnes

Frequency and duration of use

Emission days: 330 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.0000027

Emission factor - water Not applicable.

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely. Ensure operatives are trained to minimise exposures.

STP type Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Disposal method Incineration, disposal or recycling at specific offsite provider.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 0.01 mg/kg, PNEC 5.4 mg/kg, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic wide dispersive use of cellulose insulation

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic wide dispersive use of cellulose insulation
Main sector	SU22 Professional uses

Environment

Environmental release category	ERC8c Widespread use leading to inclusion into/onto article (indoor) ERC8f Widespread use leading to inclusion into/onto article (outdoor)
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Product applied to a substrate to form a solid matrix.
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Amounts used

Annual amount used in the EU: 3500000 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Not applicable for wide dispersive uses.
Emission factor - water	Release fraction to wastewater from wide dispersive use: 0.01

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

STP type	Municipal STP.
STP details	Assumed domestic sewage treatment plant flow: 2000 m ³ /day

Conditions and measures related to external treatment of waste for disposal

Disposal method	Not applicable for wide dispersive uses.
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Environmental exposure scenario for generic wide dispersive use of cellulose insulation

3. Exposure estimation (Environment 1)

Environmental exposure	STP: Exposure 9589 µg/l, PNEC 10000 µg/l, RCR 0.959 Fresh water: Exposure 1015 µg/l, PNEC 2020 µg/l, RCR 0.503
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4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of borates during the manufacture of frits

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates during the manufacture of frits
Main sector	SU3 Industrial uses
Sector of use	SU13 Manufacture of other non-metallic mineral products
<u>Environment</u>	
Environmental release category	ERC2 Formulation into mixture ERC5 Use at industrial site leading to inclusion into/onto article ERC6a Use of intermediate

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid
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Amounts used

Annual amount used in the EU: 6200 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.005
Emission factor - water	Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution	No discharge of substance into waste water.
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Formulation activity is assumed to be a predominantly enclosed process.

Environmental exposure scenario for industrial use of borates during the manufacture of frits

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Product characteristics

Physical state Solid

Amounts used

Annual amount used in the EU: 2750

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.006959

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.006959

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 5.29 mg/kg, PNEC 5.4 mg/kg, RCR 0.979

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 1940 µg/l, PNEC 2020 µg/l, RCR 0.960
Soil: Exposure 2.35 mg/kg, PNEC 5.4 mg/kg, RCR 0.435

4. Guidance to check compliance with the exposure scenario (Environment 2)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for formulation of borates into paints and coatings

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for formulation of borates into paints and coatings
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC2 Formulation into mixture
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 1000 tonnes

Frequency and duration of use

Emission days: 225 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.000097
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.005

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Formulation activity is assumed to be a predominantly enclosed process.
STP type	Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for formulation of borates into paints and coatings

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1168 µg/l, PNEC 2020 µg/l, RCR 0.578
Soil: Exposure 0.02 mg/kg, PNEC 5.4 mg/kg, RCR 0.003

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of paints and coatings containing borate compounds

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of paints and coatings containing borate compounds
Main sector	SU3 Industrial uses
<u>Environment</u>	
Environmental release category	ERC5 Use at industrial site leading to inclusion into/onto article

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 1000 tonnes

Frequency and duration of use

Emission days: 225 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.02
Emission factor - water	Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
STP type	Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for industrial use of paints and coatings containing borate compounds

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 2.45 mg/kg, PNEC 5.4 mg/kg, RCR 0.454

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic wide dispersive use of paints and coatings containing borates

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic wide dispersive use of paints and coatings containing borates
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC8c Widespread use leading to inclusion into/onto article (indoor) ERC8f Widespread use leading to inclusion into/onto article (outdoor)

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid
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Amounts used

Annual amount used in the EU: 1750000 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Not applicable for wide dispersive uses.
Emission factor - water	Release fraction to wastewater from wide dispersive use: 0.02

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

STP type	Municipal STP.
STP details	Assumed domestic sewage treatment plant flow: 2000 m ³ /day

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for generic wide dispersive use of paints and coatings containing borates

Disposal method Not applicable for wide dispersive uses.

3. Exposure estimation (Environment 1)

Environmental exposure STP: Exposure 9589 µg/l, PNEC 10000 µg/l, RCR 0.959
Fresh water: Exposure 1015 µg/l, PNEC 2020 µg/l, RCR 0.503

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic industrial use of borates resulting in inclusion into or onto a matrix

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic industrial use of borates resulting in inclusion into or onto a matrix
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC5 Use at industrial site leading to inclusion into/onto article
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 7.5 tonnes

Frequency and duration of use

Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.036562
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.5

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Formulation activity is assumed to be a predominantly enclosed process.
STP type	Municipal STP.

Environmental exposure scenario for generic industrial use of borates resulting in inclusion into or onto a matrix

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 75 tonnes

Frequency and duration of use

Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.036562

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.5

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 100

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 3)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 750 tonnes

Frequency and duration of use

Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.036562

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.5

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 1000

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Environmental exposure scenario for generic industrial use of borates resulting in inclusion into or onto a matrix

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 4)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 1150 tonnes

Frequency and duration of use

Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.036562

Emission factor - water Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution No discharge of substance into waste water.

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1931 µg/l, PNEC 2020 µg/l, RCR 0.956
Soil: Exposure 0.04 mg/kg, PNEC 5.4 mg/kg, RCR 0.007

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 1931 µg/l, PNEC 2020 µg/l, RCR 0.9956
Soil: Exposure 0.34 mg/kg, PNEC 5.4 mg/kg, RCR 0.063

4. Guidance to check compliance with the exposure scenario (Environment 2)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 3)

Environmental exposure scenario for generic industrial use of borates resulting in inclusion into or onto a matrix

Environmental exposure Fresh water: Exposure 1931 µg/l, PNEC 2020 µg/l, RCR 0.956
Soil: Exposure 3.36 mg/kg, PNEC 5.4 mg/kg, RCR 0.622

4. Guidance to check compliance with the exposure scenario (Environment 3)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 4)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 5.15 mg/kg, PNEC 5.4 mg/kg, RCR 0.954

4. Guidance to check compliance with the exposure scenario (Environment 4)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic industrial processing of articles with low abrasive techniques

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic industrial processing of articles with low abrasive techniques
Article category	AC4 Stone, plaster, cement, glass and ceramic articles
Main sector	SU3 Industrial uses SU22 Professional uses
Sector of use	SU19 Building and construction work

Environment

Environmental release category	ERC12a Processing of articles at industrial sites with low release
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Annual amount used in the EU: 30 tonnes

Frequency and duration of use

Emission days: 20 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.025
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.025

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
STP type	Municipal STP.

Environmental exposure scenario for generic industrial processing of articles with low abrasive techniques

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Amounts used

Annual amount used in the EU: 300 tonnes

Frequency and duration of use

Emission days: 20 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.025

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.025

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 100

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 3)

Amounts used

Annual amount used in the EU: 1700 tonnes

Frequency and duration of use

Emission days: 20 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.025

Emission factor - water Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution No discharge of substance into waste water.

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1932 µg/l, PNEC 2020 µg/l, RCR 0.956
Soil: Exposure 0.10 mg/kg, PNEC 5.4 mg/kg, RCR 0.018

Environmental exposure scenario for generic industrial processing of articles with low abrasive techniques

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 1932 µg/l, PNEC 2020 µg/l, RCR 0.956
Soil: Exposure 0.92 mg/kg, PNEC 5.4 mg/kg, RCR 0.171

4. Guidance to check compliance with the exposure scenario (Environment 2)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 3)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 5.21 mg/kg, PNEC 5.4 mg/kg, RCR 0.964

4. Guidance to check compliance with the exposure scenario (Environment 3)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for formulation of borate into detergents

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for formulation of borate into detergents
Main sector	SU3 Industrial uses

Environment

Environmental release category	ERC2 Formulation into mixture
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 2400 tonnes

Frequency and duration of use

Emission days: 255 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.0002
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.004

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Formulation activity is assumed to be a predominantly enclosed process.
STP type	Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for formulation of borate into detergents

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 15000 tonnes

Frequency and duration of use

Emission days: 255 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.0002

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.004

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 100

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 3)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 15000 tonnes

Frequency and duration of use

Emission days: 255 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.0002

Emission factor - water Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution No discharge of substance into waste water.

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Environmental exposure scenario for formulation of borate into detergents

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1939 µg/l, PNEC 2020 µg/l, RCR 0.960
Soil: Exposure 0.06 mg/kg, PNEC 5.4 mg/kg, RCR 0.012

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 1233 µg/l, PNEC 2020 µg/l, RCR 0.610
Soil: Exposure 0.37 mg/kg, PNEC 5.4 mg/kg, RCR 0.069

4. Guidance to check compliance with the exposure scenario (Environment 2)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 3)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 0.37 mg/kg, PNEC 5.4 mg/kg, RCR 0.069

4. Guidance to check compliance with the exposure scenario (Environment 3)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for generic wide dispersive use of borates with 100% release to water

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for generic wide dispersive use of borates with 100% release to water
Main sector	SU21 Consumer uses SU22 Professional uses

Environment

Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 35000 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Not applicable for wide dispersive uses.
Emission factor - water	Release fraction to wastewater from wide dispersive use: 1

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

STP type	Municipal STP.
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Environmental exposure scenario for generic wide dispersive use of borates with 100% release to water

STP details Assumed domestic sewage treatment plant flow: 2000 m³/day

Conditions and measures related to external treatment of waste for disposal

Disposal method Not applicable for wide dispersive uses.

3. Exposure estimation (Environment 1)

Environmental exposure STP: Exposure 9589 µg/l, PNEC 10000 µg/l, RCR 0.959
Fresh water: Exposure 1015 µg/l, PNEC 2020 µg/l, RCR 0.503

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of borates during the manufacture of glass wool

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates during the manufacture of glass wool
Main sector	SU3 Industrial uses
Sector of use	SU13 Manufacture of other non-metallic mineral products
<u>Environment</u>	
Environmental release category	ERC2 Formulation into mixture ERC5 Use at industrial site leading to inclusion into/onto article ERC6a Use of intermediate

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid
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Amounts used

Annual amount used in the EU: 15000 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.002827
Emission factor - water	Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution	No discharge of substance into waste water.
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
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Environmental exposure scenario for industrial use of borates during the manufacture of glass wool

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 5.20 mg/kg, PNEC 5.4 mg/kg, RCR 0.962

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of borates in closed systems

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates in closed systems
Main sector	SU3 Industrial uses
Sector of use	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

Environment

Environmental release category	ERC7 Use of functional fluid at industrial site
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 275 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.05
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.05

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Handle substance within a closed system.

Environmental exposure scenario for industrial use of borates in closed systems

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

2. Conditions of use affecting exposure (Industrial - Environment 2)

Product characteristics

Physical state Solid , or: Solid in solution

Amounts used

Annual amount used in the EU: 1150 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (after typical onsite RMMs): 0.0036562

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 0.0036562

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 100

Risk management measures

Good practice Clear up spills immediately and dispose of waste safely.

Technical measures Handle substance within a closed system.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1940 µg/l, PNEC 2020 µg/l, RCR 0.960
Soil: Exposure 1.24 mg/kg, PNEC 5.4 mg/kg, RCR 0.229

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

3. Exposure estimation (Environment 2)

Environmental exposure Fresh water: Exposure 844 µg/l, PNEC 2020 µg/l, RCR 0.418
Soil: Exposure 5.15 mg/kg, PNEC 5.4 mg/kg, RCR 0.954

4. Guidance to check compliance with the exposure scenario (Environment 2)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of borates in nuclear power plants with release to water

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates in nuclear power plants with release to water
Main sector	SU3 Industrial uses
Sector of use	SU23 Electricity, steam, gas, water supply and sewage treatment
<u>Environment</u>	
Environmental release category	ERC2 Formulation into mixture ERC7 Use of functional fluid at industrial site

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 13000 tonnes

Frequency and duration of use

Emission days: 32 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Negligible air emissions as process operates in a contained system.
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.013

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 200
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Handle substance within a closed system.

Environmental exposure scenario for industrial use of borates in nuclear power plants with release to water

STP type No STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 1072 µg/l, PNEC 2020 µg/l, RCR 0.531
Soil: Exposure 0 mg/kg, PNEC 5.4 mg/kg, RCR 0

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of borates in nuclear power plants without release to water

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates in nuclear power plants without release to water
Main sector	SU3 Industrial uses
Sector of use	SU23 Electricity, steam, gas, water supply and sewage treatment
<u>Environment</u>	
Environmental release category	ERC2 Formulation into mixture ERC7 Use of functional fluid at industrial site

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid , or: Solid in solution
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Amounts used

Annual amount used in the EU: 15000 tonnes

Frequency and duration of use

Emission days: 75 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.0004
Emission factor - water	Not applicable as there is no release to wastewater.

Environmental factors not influenced by risk management measures

Dilution	Not applicable as there is no release to wastewater.
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
Technical measures	Handle substance within a closed system.

Environmental exposure scenario for industrial use of borates in nuclear power plants without release to water

STP type Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 0 µg/l, PNEC 2020 µg/l, RCR 0
Soil: Exposure 0.74 mg/kg, PNEC 5.4 mg/kg, RCR 0.137

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Occupational exposure scenario for refining and processing borates

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for refining and processing borates
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals

Worker

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC14 Tableting, compression, extrusion, pelletisation, granulation
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
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Frequency and duration of use

Continuous.

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities reflect a hot process.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Handle substance within a closed system. Provide extract ventilation to material transfer points and other openings.
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Organisational measures to prevent/limit releases, dispersion and exposure

Occupational exposure scenario for refining and processing borates

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable coveralls to prevent exposure to the skin.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method MEASE

Exposure Worker - inhalation: Exposure 0.01 mg/m³, DNEL 1.45 mg/m³, RCR 0.0069
Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for loading road tankers

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for loading road tankers
Product category	PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC12 Lawn and garden preparations (- fertilizers). PC14 Metal surface treatment products PC15 Non-metal-surface treatment products. PC17 Hydraulic fluids. PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC23 Leather treatment products PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC26 Paper and board treatment products PC29 Pharmaceuticals PC30 Photochemicals. PC32 Polymer preparations and compounds. PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products PC39 Cosmetics, personal care.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals

Worker

Occupational exposure scenario for loading road tankers

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Amounts used

Amount per use: 25 tonnes

Frequency and duration of use

Application duration: 30 minutes

Other given operational conditions affecting workers exposure

Setting	Outdoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Automated process with (semi) closed systems Provide extract ventilation to points where emissions occur.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
 Use suitable eye protection.
 If above technical/organisational control measures are not feasible, then adopt following PPE:
 Wear a respirator conforming to EN140 with Type A/P2 filter or better.
 Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - inhalation: Exposure 0.37 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.26 Worker - dermal: Exposure 0.029 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for packaging into bags (25-50kg)

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for packaging into bags (25-50kg)
Product category	PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC12 Lawn and garden preparations (- fertilizers). PC14 Metal surface treatment products PC15 Non-metal-surface treatment products. PC17 Hydraulic fluids. PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC23 Leather treatment products PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC26 Paper and board treatment products PC29 Pharmaceuticals PC30 Photochemicals. PC32 Polymer preparations and compounds. PC37 Water treatment chemicals. PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products PC39 Cosmetics, personal care.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals

Worker

Occupational exposure scenario for packaging into bags (25-50kg)

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
	PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Automate activity where possible. Provide extract ventilation to points where emissions occur. Dispose of empty containers and wastes safely.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.
If above technical/organisational control measures are not feasible, then adopt following PPE:
Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - inhalation: Exposure 1 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.69 Worker - dermal: Exposure 0.144 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for packaging into big bags

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for packaging into big bags
Product category	PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC12 Lawn and garden preparations (- fertilizers). PC14 Metal surface treatment products PC15 Non-metal-surface treatment products. PC17 Hydraulic fluids. PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC23 Leather treatment products PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC26 Paper and board treatment products PC29 Pharmaceuticals PC30 Photochemicals. PC32 Polymer preparations and compounds. PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products PC39 Cosmetics, personal care.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals

Worker

Occupational exposure scenario for packaging into big bags

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
	PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Automate activity where possible. Provide extract ventilation to points where emissions occur. Dispose of empty containers and wastes safely.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.
If above technical/organisational control measures are not feasible, then adopt following PPE:
Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - inhalation: Exposure 0.58 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.4 Worker - dermal: Exposure 0.144 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/mease.php>



Exposure scenario

Occupational exposure scenario for general maintenance activities

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for general maintenance activities
Product category	PC0 Other products. PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC12 Lawn and garden preparations (- fertilizers). PC14 Metal surface treatment products PC15 Non-metal-surface treatment products. PC17 Hydraulic fluids. PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC23 Leather treatment products PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC26 Paper and board treatment products PC29 Pharmaceuticals PC30 Photochemicals. PC32 Polymer preparations and compounds. PC35 Washing and cleaning products PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products PC39 Cosmetics, personal care.
Main sector	SU3 Industrial uses

Occupational exposure scenario for general maintenance activities

Sector of use	SU1 Agriculture, forestry, fishery
	SU2b Offshore industries
	SU5 Manufacture of textiles, leather, fur
	SU6a Manufacture of wood and wood products
	SU6b Manufacture of pulp, paper and paper products
	SU7 Printing and reproduction of recorded media
	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products)
	SU9 Manufacture of fine chemicals
	SU10 Formulation [mixing] of preparations and/or re-packaging
	SU11 Manufacture of rubber products
	SU13 Manufacture of other non-metallic mineral products
	SU14 Manufacture of basic metals, including alloys
	SU15 Manufacture of fabricated metal products, except machinery and equipment
	SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
	SU19 Building and construction work

Worker

Process category	PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor/outdoor use.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Automate activity where possible. Provide extract ventilation to points where emissions occur.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
 Use suitable eye protection.
 If above technical/organisational control measures are not feasible, then adopt following PPE:
 Wear a respirator conforming to EN140 with Type A/P2 filter or better.
 Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - inhalation: Exposure 1.33 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.92
	Worker - dermal: Exposure 0.173 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

Occupational exposure scenario for general maintenance activities

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for working in a laboratory

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for working in a laboratory
Product category	PC0 Other products. PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC12 Lawn and garden preparations (- fertilizers). PC14 Metal surface treatment products PC15 Non-metal-surface treatment products. PC17 Hydraulic fluids. PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC23 Leather treatment products PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC26 Paper and board treatment products PC29 Pharmaceuticals PC30 Photochemicals. PC32 Polymer preparations and compounds. PC35 Washing and cleaning products PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products PC39 Cosmetics, personal care.
Main sector	SU3 Industrial uses SU22 Professional uses

Occupational exposure scenario for working in a laboratory

Sector of use	SU1 Agriculture, forestry, fishery
	SU2b Offshore industries
	SU6a Manufacture of wood and wood products
	SU6b Manufacture of pulp, paper and paper products
	SU7 Printing and reproduction of recorded media
	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products)
	SU9 Manufacture of fine chemicals
	SU10 Formulation [mixing] of preparations and/or re-packaging
	SU11 Manufacture of rubber products
	SU13 Manufacture of other non-metallic mineral products
	SU14 Manufacture of basic metals, including alloys
	SU15 Manufacture of fabricated metal products, except machinery and equipment
	SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

Worker

Process category	PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid, high dustiness
Concentration details	Covers concentrations up to 25 %.

Amounts used

Use of small quantities within laboratory settings, including material transfers and equipment cleaning.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.
Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Dermal MEASE Inhalation Workplace measurements
Exposure	Worker - inhalation: Exposure 0.16 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.11
	Worker - dermal: Exposure 0.014 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

Occupational exposure scenario for working in a laboratory

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/mease.php>



Exposure scenario

Occupational exposure scenario for working in a warehouse

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for working in a warehouse
Product category	PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC9b Fillers, putties, plasters, modelling clay. PC12 Lawn and garden preparations (- fertilizers). PC14 Metal surface treatment products PC15 Non-metal-surface treatment products. PC17 Hydraulic fluids. PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC23 Leather treatment products PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC26 Paper and board treatment products PC29 Pharmaceuticals PC30 Photochemicals. PC32 Polymer preparations and compounds. PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products PC39 Cosmetics, personal care.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals
<u>Worker</u>	
Process category	PROC0 Other process or activity.

Occupational exposure scenario for working in a warehouse

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Solid

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Temperature Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Handling of product in tightly-closed containers

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method Workplace measurements

Exposure Worker - inhalation: Exposure 0.3 mg/m³, DNEL 1.45 mg/m³, RCR 0.21
Dermal exposure is considered to be not relevant.

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for discharging bags (25-50kg) into mixing vessels

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for discharging bags (25-50kg) into mixing vessels
Product category	PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC12 Lawn and garden preparations (- fertilizers). PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC30 Photochemicals. PC32 Polymer preparations and compounds. PC35 Washing and cleaning products PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products
Main sector	SU3 Industrial uses

Occupational exposure scenario for discharging bags (25-50kg) into mixing vessels

Sector of use	SU1 Agriculture, forestry, fishery
	SU5 Manufacture of textiles, leather, fur
	SU6a Manufacture of wood and wood products
	SU6b Manufacture of pulp, paper and paper products
	SU7 Printing and reproduction of recorded media
	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products)
	SU9 Manufacture of fine chemicals
	SU10 Formulation [mixing] of preparations and/or re-packaging
	SU11 Manufacture of rubber products
	SU13 Manufacture of other non-metallic mineral products
	SU14 Manufacture of basic metals, including alloys
	SU15 Manufacture of fabricated metal products, except machinery and equipment
	SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
	SU23 Electricity, steam, gas, water supply and sewage treatment
	SU9 Manufacture of fine chemicals

Worker

Process category	PROC4 Chemical production where opportunity for exposure arises
	PROC5 Mixing or blending in batch processes

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Application duration: 1 hour

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Automate activity where possible. Provide extract ventilation to points where emissions occur. Dispose of empty containers and wastes safely.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.
If above technical/organisational control measures are not feasible, then adopt following PPE:
Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - inhalation: Exposure 0.78 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.54
	Worker - dermal: Exposure 0.48 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

Occupational exposure scenario for discharging bags (25-50kg) into mixing vessels

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for discharging big bags (750-1500kg) into mixing vessels

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for discharging big bags (750-1500kg) into mixing vessels
Product category	PC1 Adhesives, sealants. PC4 Anti-freeze and de-icing products. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC12 Lawn and garden preparations (- fertilizers). PC16 Heat transfer fluids. PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC30 Photochemicals. PC32 Polymer preparations and compounds. PC35 Washing and cleaning products PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products
Main sector	SU3 Industrial uses

Occupational exposure scenario for discharging big bags (750-1500kg) into mixing vessels

Sector of use	SU1 Agriculture, forestry, fishery
	SU5 Manufacture of textiles, leather, fur
	SU6a Manufacture of wood and wood products
	SU6b Manufacture of pulp, paper and paper products
	SU7 Printing and reproduction of recorded media
	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products)
	SU9 Manufacture of fine chemicals
	SU10 Formulation [mixing] of preparations and/or re-packaging
	SU11 Manufacture of rubber products
	SU13 Manufacture of other non-metallic mineral products
	SU14 Manufacture of basic metals, including alloys
	SU15 Manufacture of fabricated metal products, except machinery and equipment
	SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
	SU23 Electricity, steam, gas, water supply and sewage treatment
	SU9 Manufacture of fine chemicals

Worker

Process category	PROC4 Chemical production where opportunity for exposure arises
	PROC5 Mixing or blending in batch processes
	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Frequency and duration of use

Application duration: 1 hour

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Automate activity where possible. Provide extract ventilation to points where emissions occur. Dispose of empty containers and wastes safely.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.
Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Wear a respirator providing a minimum efficiency of (%): 90

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
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Occupational exposure scenario for discharging big bags (750-1500kg) into mixing vessels

Exposure

Worker - inhalation: Exposure 0.2 mg/m³, DNEL 1.45 mg/m³, RCR 0.14

Worker - dermal: Exposure 4.8 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for transfer of substance or preparation from/to large vessels/containers at dedicated facilities

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for transfer of substance or preparation from/to large vessels/containers at dedicated facilities
Product category	PC0 Other products. PC1 Adhesives, sealants. PC7 Base metals and alloys. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC12 Lawn and garden preparations (- fertilizers). PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC32 Polymer preparations and compounds. PC35 Washing and cleaning products PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products
Main sector	SU3 Industrial uses

Occupational exposure scenario for transfer of substance or preparation from/to large vessels/containers at dedicated facilities

Sector of use	SU1 Agriculture, forestry, fishery
	SU2b Offshore industries
	SU6a Manufacture of wood and wood products
	SU6b Manufacture of pulp, paper and paper products
	SU7 Printing and reproduction of recorded media
	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products)
	SU9 Manufacture of fine chemicals
	SU10 Formulation [mixing] of preparations and/or re-packaging
	SU11 Manufacture of rubber products
	SU13 Manufacture of other non-metallic mineral products
	SU14 Manufacture of basic metals, including alloys
	SU15 Manufacture of fabricated metal products, except machinery and equipment
	SU16 Manufacture of computer, electronic and optical products, electrical equipment
	SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
	SU18 Manufacture of furniture
	SU19 Building and construction work

Worker

Process category	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Amounts used

Amount per use: 25-40 tonnes

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).
Application duration: 2 hours

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Handle substance within a predominantly closed system provided with extract ventilation.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Inhalation Used ART model. Dermal MEASE
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Occupational exposure scenario for transfer of substance or preparation from/to large vessels/containers at dedicated facilities

Exposure

Worker - inhalation: Exposure 0.03 mg/m³, DNEL 1.45 mg/m³, RCR 0.21

Worker - dermal: Exposure 0.024 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for transfer of substances into small containers

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for transfer of substances into small containers
Product category	PC0 Other products. PC1 Adhesives, sealants. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC12 Lawn and garden preparations (- fertilizers). PC18 Ink and toners. PC19 Intermediate. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC21 Laboratory chemicals. PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC30 Photochemicals. PC35 Washing and cleaning products PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products
Main sector	SU3 Industrial uses
Sector of use	SU1 Agriculture, forestry, fishery SU6a Manufacture of wood and wood products SU6b Manufacture of pulp, paper and paper products SU7 Printing and reproduction of recorded media SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals SU10 Formulation [mixing] of preparations and/or re-packaging SU11 Manufacture of rubber products SU13 Manufacture of other non-metallic mineral products SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

Worker

Occupational exposure scenario for transfer of substances into small containers

Process category PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Solid , or: Liquid

Concentration details Covers concentrations up to 8.6 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Indoor.

Temperature Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Automate activity where possible. Provide extract ventilation to points where emissions occur.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

If above technical/organisational control measures are not feasible, then adopt following PPE:

Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method MEASE

Exposure

Worker - inhalation: Exposure 0.4 mg/m³, DNEL 1.45 mg/m³, RCR 0.28

Powder products

Worker - dermal: Exposure 1.44 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

Liquid products

Worker - dermal: Exposure 0.144 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for compaction and tableting of borate-containing powders

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for compaction and tableting of borate-containing powders
Product category	PC0 Other products. PC1 Adhesives, sealants. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC12 Lawn and garden preparations (- fertilizers). PC18 Ink and toners. PC19 Intermediate. PC35 Washing and cleaning products PC37 Water treatment chemicals.
Main sector	SU3 Industrial uses
Sector of use	SU1 Agriculture, forestry, fishery SU6a Manufacture of wood and wood products SU6b Manufacture of pulp, paper and paper products SU7 Printing and reproduction of recorded media SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals SU10 Formulation [mixing] of preparations and/or re-packaging SU11 Manufacture of rubber products SU13 Manufacture of other non-metallic mineral products SU15 Manufacture of fabricated metal products, except machinery and equipment

Worker

Process category	PROC14 Tableting, compression, extrusion, pelletisation, granulation
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid, high dustiness
Concentration details	Covers concentrations up to 100 %.

Occupational exposure scenario for compaction and tableting of borate-containing powders

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).
Ventilation rate	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable working clothes.
Use suitable eye protection.

Additional advice If above technical/organisational control measures are not feasible, then adopt following PPE:
Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Dermal MEASE Inhalation Workplace measurements
Exposure	Worker - inhalation: Exposure 1.3 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.90 Worker - dermal: Exposure 2.4 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for industrial use of abrasives

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for industrial use of abrasives
Article category	AC4 Stone, plaster, cement, glass and ceramic articles
Main sector	SU3 Industrial uses SU22 Professional uses
Sector of use	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
<u>Worker</u>	
Process category	PROC24 High (mechanical) energy work-up of substances bound in/on materials and/or articles

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 5 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Provide extract ventilation to points where emissions occur.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Occupational exposure scenario for industrial use of abrasives

Wear suitable working clothes.

Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - inhalation: Exposure 0.166 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.11 SU3 Industrial uses Worker - dermal: Exposure 0.198 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001 SU22 Professional uses Worker - dermal: Exposure 0.119 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for closed production at ambient temperatures

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for closed production at ambient temperatures
Product category	PC0 Other products. PC1 Adhesives, sealants. PC8 Biocidal products PC9a Coatings and paints, thinners, paint removers. PC12 Lawn and garden preparations (- fertilizers). PC18 Ink and toners. PC19 Intermediate. PC21 Laboratory chemicals. PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC24 Lubricants, greases and release products. PC25 Metal working fluids. PC35 Washing and cleaning products PC37 Water treatment chemicals. PC38 Welding and soldering products, flux products
Main sector	SU3 Industrial uses
Sector of use	SU1 Agriculture, forestry, fishery SU2b Offshore industries SU5 Manufacture of textiles, leather, fur SU6a Manufacture of wood and wood products SU6b Manufacture of pulp, paper and paper products SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals SU10 Formulation [mixing] of preparations and/or re-packaging SU11 Manufacture of rubber products SU13 Manufacture of other non-metallic mineral products SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU19 Building and construction work SU23 Electricity, steam, gas, water supply and sewage treatment

Worker

Occupational exposure scenario for closed production at ambient temperatures

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
	PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Amounts used

Amount per use: 1 tonne

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Handle substance within a closed system. Provide extract ventilation to material transfer points and other openings.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
 Use suitable eye protection.
 If above technical/organisational control measures are not feasible, then adopt following PPE:
 Wear a respirator conforming to EN140 with Type A/P2 filter or better.
 Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - inhalation: Exposure 0.08 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.06 Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for industrial application of adhesive

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for industrial application of adhesive
Product category	PC1 Adhesives, sealants.
Main sector	SU3 Industrial uses
Sector of use	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, e.g. machinery, equipment, vehicles, other transport equipment SU18 Manufacture of furniture SU19 Building and construction work

Worker

Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC5 Mixing or blending in batch processes PROC7 Industrial spraying PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC10 Roller application or brushing PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Concentration of substance in product: 1.5%

Amounts used

Occupational exposure scenario for industrial application of adhesive

Daily amount per site: 300 kg

Frequency and duration of use

Continuous process

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Indoor.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Automate activity where possible. Provide extract ventilation to points where emissions occur.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method Inhalation Used ART model. Dermal MEASE

Exposure Worker - inhalation: Exposure 0.11 mg/m³, DNEL 1.45 mg/m³, RCR 0.076
Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for professional application of adhesive

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for professional application of adhesive
Product category	PC1 Adhesives, sealants.
Main sector	SU22 Professional uses
Sector of use	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, e.g. machinery, equipment, vehicles, other transport equipment SU18 Manufacture of furniture SU19 Building and construction work
<u>Worker</u>	
Process category	PROC10 Roller application or brushing PROC11 Non industrial spraying PROC13 Treatment of articles by dipping and pouring.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid , or: Pasty
Concentration details	Concentration of substance in product: 1.5%

Amounts used

Daily amount per site: 300 kg

Frequency and duration of use

Covers daily exposure up to 2hours

Other given operational conditions affecting workers exposure

Setting	Indoor.
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Technical conditions and measures at process level (source) to prevent release

Occupational exposure scenario for professional application of adhesive

Technical protective measures Automate activity where possible. Provide extract ventilation to points where emissions occur.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method Inhalation Used ART model. Dermal MEASE

Exposure Worker - inhalation: Exposure 0.041 mg/m³, DNEL 1.45 mg/m³, RCR 0.028
Worker - dermal: Exposure 0.288 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for fertigation using boron containing liquid fertilizer

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for fertigation using boron containing liquid fertilizer
Product category	PC12 Lawn and garden preparations (- fertilizers).
Main sector	SU22 Professional uses
Sector of use	SU1 Agriculture, forestry, fishery
<u>Worker</u>	
Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Concentration of substance in product: 7%

Frequency and duration of use

Loading of application equipment
Covers frequency up to 2 day/week, , .
Application duration: 15 minutes

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Handle substance within a closed system.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Occupational exposure scenario for fertigation using boron containing liquid fertilizer

Assessment method	MEASE
Exposure	Worker - dermal: Exposure 0.014 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001 Worker - inhalation Not relevant.

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/mease.php>



Exposure scenario

Occupational exposure scenario for transfer of boron-containing granular fertiliser

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for transfer of boron-containing granular fertiliser
Product category	PC12 Lawn and garden preparations (- fertilizers).
Main sector	SU22 Professional uses
Sector of use	SU1 Agriculture, forestry, fishery
<u>Worker</u>	
Process category	PROC5 Mixing or blending in batch processes PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 4.5 %.

Frequency and duration of use

Loading of application equipment
Application duration: 1 hour
Covers frequency up to 2 days/year, , .

Other given operational conditions affecting workers exposure

Setting	Indoor/outdoor use.
Temperature	Assumes activities are at ambient temperature (unless stated differently).
Ventilation rate	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.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Occupational exposure scenario for transfer of boron-containing granular fertiliser

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

If above technical/organisational control measures are not feasible, then adopt following PPE:

Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Inhalation Used ART model. Dermal MEASE
Exposure	Worker - inhalation: Exposure 1.22 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.84 Worker - dermal: Exposure 0.019 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for transfer of boron-containing liquid foliar fertilizer

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for transfer of boron-containing liquid foliar fertilizer
Product category	PC12 Lawn and garden preparations (- fertilizers).
Main sector	SU22 Professional uses
Sector of use	SU1 Agriculture, forestry, fishery
<u>Worker</u>	
Process category	PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers concentrations up to 7 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Outdoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures No specific risk management measure identified beyond those operational conditions stated.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Occupational exposure scenario for transfer of boron-containing liquid foliar fertilizer

Wear suitable working clothes.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Solid in solution. For non-spraying processes (no aerosol generation), an inhalation exposure is considered to be not relevant. Worker - dermal: Exposure 0.29 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for spreading of boron containing granular fertiliser

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for spreading of boron containing granular fertiliser
Product category	PC12 Lawn and garden preparations (- fertilizers).
Main sector	SU22 Professional uses
Sector of use	SU1 Agriculture, forestry, fishery
<u>Worker</u>	
Process category	PROC11 Non industrial spraying

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 21 %.

Frequency and duration of use

Covers frequency up to 4 days/year, , .

Other given operational conditions affecting workers exposure

Setting	Outdoor.
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Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Ensure that spray direction is only horizontal or downward. Ensure that the worker is situated in an open or closed cabin. Ensure that the task is being carried out outside the breathing zone of a worker (distance head-product greater than 1m).
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Assumes a good basic standard of occupational hygiene is implemented.

Occupational exposure scenario for spreading of boron containing granular fertiliser

3. Exposure estimation (Health 1)

Assessment method Used ART model.

Exposure Dermal exposure is considered to be not relevant.
Complete personal enclosure with ventilation.
Worker - inhalation: Exposure 0.0004 mg/m³, DNEL 1.45 mg/m³, RCR 0.001
Complete personal enclosure without ventilation.
Worker - inhalation: Exposure 0.003 mg/m³, DNEL 1.45 mg/m³, RCR 0.0021

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for application of boron-containing liquid fertiliser

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for application of boron-containing liquid fertiliser
Product category	PC12 Lawn and garden preparations (- fertilizers).
Main sector	SU22 Professional uses
Sector of use	SU1 Agriculture, forestry, fishery
<u>Worker</u>	
Process category	PROC11 Non industrial spraying PROC13 Treatment of articles by dipping and pouring.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers concentrations up to 7.7 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Outdoor.
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Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Ensure that spray direction is only horizontal or downward. Ensure that the worker is situated in an open or closed cabin.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Assumes a good basic standard of occupational hygiene is implemented.

Occupational exposure scenario for application of boron-containing liquid fertiliser

3. Exposure estimation (Health 1)

Assessment method	Inhalation Used ART model. Dermal MEASE
Exposure	Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001 Manual spraying Worker - inhalation: Exposure 0.17 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.12 Spraying/fogging by machine application Worker - inhalation: Exposure 0.0014 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for general production activities - closed processes and largely closed processes at high temperature

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for general production activities - closed processes and largely closed processes at high temperature
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals SU10 Formulation [mixing] of preparations and/or re-packaging SU13 Manufacture of other non-metallic mineral products SU14 Manufacture of basic metals, including alloys SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

Worker

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC22 Manufacturing and processing of minerals and/or metals at substantially elevated temperature PROC23 Open processing and transfer operations at substantially elevated temperature
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
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Frequency and duration of use

Continuous.

Other given operational conditions affecting workers exposure

Occupational exposure scenario for general production activities - closed processes and largely closed processes at high temperature

Setting Indoor.

Temperature Assumes activities reflect a hot process.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Handle substance within a closed system. Provide extract ventilation to material transfer points and other openings.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable coveralls to prevent exposure to the skin.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method MEASE

Exposure Worker - inhalation: Exposure 0.01 mg/m³, DNEL 1.45 mg/m³, RCR 0.0069
Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for industrial use of paints and coatings

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for industrial use of paints and coatings
Product category	PC9a Coatings and paints, thinners, paint removers. PC18 Ink and toners.
Main sector	SU3 Industrial uses
Sector of use	SU7 Printing and reproduction of recorded media
<u>Worker</u>	
Process category	PROC7 Industrial spraying PROC10 Roller application or brushing

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers concentrations up to 3.6 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).
Ventilation rate	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.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Provide extract ventilation to points where emissions occur.

Organisational measures to prevent/limit releases, dispersion and exposure

Occupational exposure scenario for industrial use of paints and coatings

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

PROC7 Industrial spraying

If above technical/organisational control measures are not feasible, then adopt following PPE:

Wear a full-face respirator conforming to EN136 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method Inhalation Used ART model. Dermal MEASE

Exposure Worker - inhalation: Exposure 0.67 mg/m³, DNEL 1.45 mg/m³, RCR 0.46
Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for professional use of paints and coatings

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for professional use of paints and coatings
Product category	PC9a Coatings and paints, thinners, paint removers. PC18 Ink and toners.
Main sector	SU22 Professional uses
<u>Worker</u>	
Process category	PROC10 Roller application or brushing PROC11 Non industrial spraying

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers concentrations up to 3.6 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).
Ventilation rate	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.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Provide extract ventilation to points where emissions occur.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Occupational exposure scenario for professional use of paints and coatings

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

If above technical/organisational control measures are not feasible, then adopt following PPE:

Wear a full-face respirator conforming to EN136 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Inhalation Used ART model. Dermal MEASE
Exposure	Worker - inhalation: Exposure 0.67 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.46 Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for professional installation of plasterboard, board and other products

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for professional installation of plasterboard, board and other products
Product category	PC8 Biocidal products
Article category	AC4 Stone, plaster, cement, glass and ceramic articles
Main sector	SU22 Professional uses
Sector of use	SU19 Building and construction work
<u>Worker</u>	
Process category	PROC21 Low energy manipulation and handling of substances bound in/on materials or articles

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 1 %.

Frequency and duration of use

Covers daily exposure up to 4hours

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures.
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Risk management measures

Occupational exposure scenario for professional installation of plasterboard, board and other products

Wear suitable working clothes.

Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - inhalation: Exposure 0.005 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.0034 Worker - dermal: Exposure 0.99 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for use of fabric detergents in industrial or professional settings

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for use of fabric detergents in industrial or professional settings
Product category	PC35 Washing and cleaning products
Main sector	SU22 Professional uses
<u>Worker</u>	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC10 Roller application or brushing PROC11 Non industrial spraying PROC13 Treatment of articles by dipping and pouring. PROC19 Manual activities involving hand contact

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid , or: Gel
Concentration details	Concentration of substance in product: 1%

Amounts used

Small scale

Frequency and duration of use

Occupational exposure scenario for use of fabric detergents in industrial or professional settings

Machine
Covers daily exposure up to 5minutes
Hand
Application duration: <60 minutes

Other given operational conditions affecting workers exposure

Setting Indoor.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method MEASE

Exposure Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001
Worker - inhalation
Not relevant.

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for diluting Metal Working Fluid concentrate with water

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for diluting Metal Working Fluid concentrate with water
Product category	PC25 Metal working fluids.
Main sector	SU3 Industrial uses
Sector of use	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
<u>Worker</u>	
Process category	PROC5 Mixing or blending in batch processes

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers concentrations up to 5.5 %.

Frequency and duration of use

Application duration: 1 hour

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

Occupational exposure scenario for diluting Metal Working Fluid concentrate with water

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	Worker - dermal: Exposure 0.005 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001 Worker - inhalation Not applicable.

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for use of cleaning solutions in industrial or professional settings

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for use of cleaning solutions in industrial or professional settings
Product category	PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents PC35 Washing and cleaning products
Main sector	SU3 Industrial uses
Sector of use	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
<u>Worker</u>	
Process category	PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC4 Chemical production where opportunity for exposure arises PROC7 Industrial spraying PROC10 Roller application or brushing PROC11 Non industrial spraying PROC19 Manual activities involving hand contact

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers concentrations up to 25 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Occupational exposure scenario for use of cleaning solutions in industrial or professional settings

Ventilation rate 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.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable working clothes.
Use suitable eye protection.

Additional advice Avoid splashing.
Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method Inhalation Used ART model. Dermal MEASE

Exposure Spraying
Worker - inhalation: Exposure 1.2 mg/m³, DNEL 1.45 mg/m³, RCR 0.83
Worker - dermal: Exposure 0.14 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001
Roller, spreader, flow application
Worker - inhalation: Exposure 0.11 mg/m³, DNEL 1.45 mg/m³, RCR 0.076
Worker - dermal: Exposure 14.4 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.003

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for make up of treatment bath for galvanising, plating and other surface treatments

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for make up of treatment bath for galvanising, plating and other surface treatments
Product category	PC14 Metal surface treatment products
Main sector	SU3 Industrial uses
Sector of use	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

Worker

Process category	PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 100 %.

Amounts used

Amount per use: 200 kg

Frequency and duration of use

Covers frequency up to 2 days/week, , .
Application duration: 30 minutes

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Use canopy hood (over hot process).
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Occupational exposure scenario for make up of treatment bath for galvanising, plating and other surface treatments

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

If above technical/organisational control measures are not feasible, then adopt following PPE:

Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method MEASE

Exposure Worker - inhalation: Exposure 0.78 mg/m³, DNEL 1.45 mg/m³, RCR 0.54
Worker - dermal: Exposure 0.288 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for galvanising, plating and other surface treatment of metal articles

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for galvanising, plating and other surface treatment of metal articles
Product category	PC14 Metal surface treatment products
Main sector	SU3 Industrial uses
Sector of use	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

Worker

Process category	PROC13 Treatment of articles by dipping and pouring.
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Concentration of substance in product: 1%

Amounts used

Amount per use: 25-200 kg

Frequency and duration of use

Covers daily exposure up to 1 hour
Continuous process

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities and processes are carried out at a temperature of 60°C.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Use canopy hood (over hot process).

Occupational exposure scenario for galvanising, plating and other surface treatment of metal articles

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable coveralls to prevent exposure to the skin.

Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method MEASE

Exposure Solid in solution. For non-spraying processes (no aerosol generation), an inhalation exposure is considered to be not relevant.

Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for use of MWFs in machining

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for use of MWFs in machining
Product category	PC25 Metal working fluids.
Main sector	SU3 Industrial uses
Sector of use	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
<u>Worker</u>	
Process category	PROC17 Lubrication at high energy conditions in metal working operations PROC24 High (mechanical) energy work-up of substances bound in/on materials and/or articles

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers concentrations up to 5.5 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities reflect a hot process.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Minimise exposure by extracted full enclosure for the operation or equipment.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Occupational exposure scenario for use of MWFs in machining

Risk management measures

Wear suitable working clothes.
Use suitable eye protection.

Additional advice

If above technical/organisational control measures are not feasible, then adopt following PPE:
Wear a respirator conforming to EN140 with Type A/P2 filter or better.
Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method

Dermal MEASE Inhalation Workplace measurements

Exposure

Worker - inhalation: Exposure 0.07 mg/m³, DNEL 1.45 mg/m³, RCR 0.048
Worker - dermal: Exposure 2.4 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for industrial use of flux pastes to coat welding/brazing rods

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for industrial use of flux pastes to coat welding/brazing rods
Product category	PC38 Welding and soldering products, flux products
Article category	AC7 Metal articles
Main sector	SU3 Industrial uses
Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging
<u>Worker</u>	
Process category	PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC14 Tableting, compression, extrusion, pelletisation, granulation

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
Concentration details	Covers concentrations up to 1.48 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures.
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Risk management measures

Occupational exposure scenario for industrial use of flux pastes to coat welding/brazing rods

Wear suitable working clothes.
Use suitable eye protection.
In case of any doubt, wear a half-mask respirator to EN 529.
with filter for particulates: P3.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Inhalation Used ART model. Dermal MEASE
Exposure	Worker - inhalation: Exposure 0.043 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.03 Worker - dermal: Exposure 0.29 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for industrial/professional use of fluxes in welding/brazing

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for industrial/professional use of fluxes in welding/brazing
Product category	PC38 Welding and soldering products, flux products
Main sector	SU3 Industrial uses SU22 Professional uses
Sector of use	SU14 Manufacture of basic metals, including alloys SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU19 Building and construction work

Worker

Process category	PROC25 Other hot work operations with metals
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Pasty
Concentration details	Covers concentrations up to 1.48 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures	Provide extract ventilation to points where emissions occur.
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Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures.
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Occupational exposure scenario for industrial/professional use of fluxes in welding/brazing

Risk management measures

Wear suitable working clothes.

Use suitable eye protection.

Wear a respirator providing a minimum efficiency of (%): 95
with filter for particulates: P3.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method MEASE

Exposure Worker - inhalation: Exposure 0.005 mg/m³, DNEL 1.45 mg/m³, RCR 0.001
Worker - dermal: Exposure 0.2 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for industrial crushing grinding processes

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for industrial crushing grinding processes
Product category	PC19 Intermediate.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals SU13 Manufacture of other non-metallic mineral products

Worker

Process category	PROC24 High (mechanical) energy work-up of substances bound in/on materials and/or articles
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid
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Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Minimise exposure by extracted full enclosure for the operation or equipment.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures Ensure operatives are trained to minimise exposures.

Risk management measures

Occupational exposure scenario for industrial crushing grinding processes

Wear suitable working clothes.

Use suitable eye protection.

Material transfers

Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Exposure

Not applicable.
(closed systems)

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for make up of stock solution - photographic applications

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for make up of stock solution - photographic applications
Product category	PC30 Photochemicals.
Main sector	SU3 Industrial uses
<u>Worker</u>	
Process category	PROC19 Manual activities involving hand contact

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid , or: Solid in solution
Concentration details	Powders Concentration of substance in product: 5% Solid in solution Concentration of substance in product: 1%

Amounts used

Amount per use: 50 litre

Frequency and duration of use

Covers weekly exposure up to 15minutes

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.

Occupational exposure scenario for make up of stock solution - photographic applications

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Dermal MEASE Inhalation Used ART model.
Exposure	Worker - inhalation: Exposure 0.001 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.001 Worker - dermal: Exposure 0.198 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for use of developer and fixer solutions in photographic applications

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for use of developer and fixer solutions in photographic applications
Product category	PC30 Photochemicals.
Main sector	SU22 Professional uses
<u>Worker</u>	
Process category	PROC13 Treatment of articles by dipping and pouring.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers concentrations up to 1 %.

Amounts used

Amount per use: 50 litre

Frequency and duration of use

Loading of application equipment
Application duration: 12 minutes

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Automated process with (semi) closed systems

Organisational measures to prevent/limit releases, dispersion and exposure

Occupational exposure scenario for use of developer and fixer solutions in photographic applications

Organisational measures Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.

Risk management measures

Wear suitable coveralls to prevent exposure to the skin.

Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method MEASE

Exposure Solid in solution. For non-spraying processes (no aerosol generation), an inhalation exposure is considered to be not relevant.

Worker - dermal: Exposure 0.024 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for preparing and applying refractory mixes

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for preparing and applying refractory mixes
Product category	PC0 Other products. PC15 Non-metal-surface treatment products.
Main sector	SU3 Industrial uses
Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging SU14 Manufacture of basic metals, including alloys SU15 Manufacture of fabricated metal products, except machinery and equipment

Worker

Process category	PROC7 Industrial spraying PROC19 Manual activities involving hand contact
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid , or: Solid in solution
Concentration details	Covers concentrations up to 5 %.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities reflect a hot process.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Occupational exposure scenario for preparing and applying refractory mixes

Wear suitable working clothes.

Use suitable eye protection.

If above technical/organisational control measures are not feasible, then adopt following PPE:

Wear a full-face respirator conforming to EN136 with Type A/P2 filter or better.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method

Inhalation Used ART model. Dermal MEASE

Exposure

PROC7 Industrial spraying

Worker - inhalation: Exposure 0.012 mg/m³, DNEL 1.45 mg/m³, RCR 0.008

PROC7 Industrial spraying

Worker - dermal: Exposure 0.42 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

PROC19 Manual activities involving hand contact

Worker - dermal: Exposure 2.4 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for professional use of swimming pool tablets

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for professional use of swimming pool tablets
Main sector	SU22 Professional uses
<u>Worker</u>	
Process category	PROC0 Other process or activity.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid, low dustiness
Concentration details	Concentration of substance in product: 5%

Amounts used

Amount per use: 200 g

Frequency and duration of use

Application duration: 5 minutes

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures.
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Risk management measures

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	MEASE
Exposure	The use is assessed to be safe.

4. Guidance to check compliance with the exposure scenario (Health 1)

Occupational exposure scenario for professional use of swimming pool tablets

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Environmental exposure scenario for industrial use of borates during the manufacture of high alkali glass

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates during the manufacture of high alkali glass
Main sector	SU3 Industrial uses
Sector of use	SU13 Manufacture of other non-metallic mineral products
<u>Environment</u>	
Environmental release category	ERC2 Formulation into mixture ERC5 Use at industrial site leading to inclusion into/onto article ERC6a Use of intermediate

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid
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Amounts used

Annual amount used in the EU: 6200 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.006959
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.001

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 181
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
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Environmental exposure scenario for industrial use of borates during the manufacture of high alkali glass

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 995 µg/l, PNEC 2020 µg/l, RCR 0.493
Soil: Exposure 5.29 mg/kg, PNEC 5.4 mg/kg, RCR 0.979

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Environmental exposure scenario for industrial use of borates during the manufacture of low alkali glass

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Environmental exposure scenario for industrial use of borates during the manufacture of low alkali glass
Main sector	SU3 Industrial uses
Sector of use	SU13 Manufacture of other non-metallic mineral products
<u>Environment</u>	
Environmental release category	ERC2 Formulation into mixture ERC5 Use at industrial site leading to inclusion into/onto article ERC6a Use of intermediate

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Physical state	Solid
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Amounts used

Annual amount used in the EU: 1150 tonnes

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs): 0.036562
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.001

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 181
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Risk management measures

Good practice	Clear up spills immediately and dispose of waste safely.
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Environmental exposure scenario for industrial use of borates during the manufacture of low alkali glass

Technical measures Formulation activity is assumed to be a predominantly enclosed process.

STP type Municipal STP.

Conditions and measures related to external treatment of waste for disposal

Disposal method This material and its container must be disposed of as hazardous waste.

3. Exposure estimation (Environment 1)

Environmental exposure Fresh water: Exposure 231 µg/l, PNEC 2020 µg/l, RCR 0.114
Soil: Exposure 5.15 mg/kg, PNEC 5.4 mg/kg, RCR 0.954

4. Guidance to check compliance with the exposure scenario (Environment 1)

Predicted exposures are not expected to exceed the applicable exposure limits (given in Section 8 of the SDS) when the operational conditions/risk management measures given in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



Exposure scenario

Occupational exposure scenario for greasing at high energy conditions

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for greasing at high energy conditions
Product category	PC24 Lubricants, greases and release products.
Main sector	SU3 Industrial uses
Sector of use	SU15 Manufacture of fabricated metal products, except machinery and equipment SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

Worker

Process category	PROC18 General greasing/lubrication at high kinetic energy conditions
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Concentration of substance in product: 0.01%

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities reflect a hot process.

Technical conditions and measures at process level (source) to prevent release

Technical protective measures Minimise exposure by extracted full enclosure for the operation or equipment.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures. Regular inspection and maintenance of equipment and machines.
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Risk management measures

Occupational exposure scenario for greasing at high energy conditions

Wear suitable working clothes.

Use suitable eye protection.

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Dermal MEASE Inhalation Used ART model.
Exposure	Worker - inhalation: Exposure 0.0017 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.0012 Worker - dermal: Exposure 0.048 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>



Exposure scenario

Occupational exposure scenario for professional installation of cellulose insulation

Identification

Product name	Boric acid, boric oxide and sodium borates (exposures based on boron content)
Supplier	Univar Solutions UK Ltd Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 SDS.EMEA@univarsolutions.com

1. Title of exposure scenario

Main title	Occupational exposure scenario for professional installation of cellulose insulation
Product category	PC0 Other products.
Article category	AC4 Stone, plaster, cement, glass and ceramic articles
Main sector	SU22 Professional uses
Sector of use	SU19 Building and construction work
<u>Worker</u>	
Process category	PROC21 Low energy manipulation and handling of substances bound in/on materials or articles

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Solid, high dustiness
Concentration details	Concentration of substance in product: 1.5-3.6%

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Indoor.
Temperature	Assumes activities are at ambient temperature (unless stated differently).

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	Ensure operatives are trained to minimise exposures.
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Risk management measures

Wear suitable working clothes.
Use suitable eye protection.
Wear a respirator conforming to EN140 with Type A/P2 filter or better.

Occupational exposure scenario for professional installation of cellulose insulation

Assumes a good basic standard of occupational hygiene is implemented.

3. Exposure estimation (Health 1)

Assessment method	Dermal MEASE Inhalation Workplace measurements
Exposure	Worker - inhalation: Exposure 0.3 mg/m ³ , DNEL 1.45 mg/m ³ , RCR 0.21 Worker - dermal: Exposure 0.15 mg/kg/day, DNEL 4800 mg/kg/day, RCR 0.001

4. Guidance to check compliance with the exposure scenario (Health 1)

Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. For scaling see <http://www.ebrc.de/ebrc/ebrc-mease.php>