



Safety data sheet  
according to 1907/2006/EC, Article 31

Printing date 01.04.2015

Version number 3

Revision: 30.03.2015

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Trade name: **FERROGRANUL 20**  
CAS Number: 7782-63-0  
EC number: 231-753-5  
Index number: 026-003-01-4

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

Precipitant and flocculant  
Municipal sewage treatment  
Water treatment  
Use in landremediation  
Chromate reduction in cement  
Fertiliser production  
Chlorosis control

**Uses advised against**

None

**1.3 Details of the supplier of the safety data sheet**

Manufacturer/Supplier: KRONOS INTERNATIONAL, Inc.  
Peschstraße 5  
51373 Leverkusen, Germany  
Tel.: INT +49 214 356-0

**Informing department:**

KRONOS ecochem  
Tel.: INT + 49 214 - 356-0  
Fax: INT + 49 214 - 44117  
E-mail: kronos.ecochem@kronosww.com

**1.4 EMERGENCY TELEPHONE**

NUMBER: Tel.: INT + 49 214 356-4444

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Skin Irrit. 2 H315 Causes skin irritation.

Eye Irrit. 2 H319 Causes serious eye irritation.

**Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Xn; Harmful

R22: Harmful if swallowed.



Xi; Irritant

R36/38: Irritating to eyes and skin.

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**2.2 Label elements****Labelling according to****Regulation (EC) No 1272/2008****Hazard pictograms**

The substance is classified and labelled according to the CLP regulation.



GHS07

**Signal word**

Warning

**Hazard-determining  
components of labelling:  
Hazard statements**

Ferrous sulphate heptahydrate

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

**Precautionary statements**

P280

Wear protective gloves / eye protection.

P301+P312

IF SWALLOWED: Call a POISON CENTER or doctor/  
physician if you feel unwell.

P302+P352

IF ON SKIN: Wash with plenty of soap and water.

P332+P313

If skin irritation occurs: Get medical advice/attention.

P305+P351+P338

IF IN EYES: Rinse cautiously with water for several  
minutes. Remove contact lenses, if present and easy to  
do. Continue rinsing.

P337+P313

If eye irritation persists: Get medical advice/attention.

**SECTION 3: Composition/information on ingredients****3.1 Chemical characterization: Substances****CAS No. Designation:** 7782-63-0 iron(II) sulfate (1:1) heptahydrate**EC number:** 231-753-5**Index number:** 026-003-01-4**SECTION 4: First aid measures****4.1 Description of first aid measures****After inhalation:** Supply fresh air; consult doctor in case of symptoms.**After skin contact:** Instantly wash with water and soap and rinse thoroughly.  
If skin irritation continues, consult a doctor.**After eye contact:** Rinse opened eye for several minutes under running water. Then consult  
doctor.**After swallowing:** Rinse out mouth and then drink plenty of water.  
Call a doctor immediately.

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

No further relevant information available.

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

No further relevant information available.

**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing agents:** Use fire fighting measures that suit the environment.  
CO<sub>2</sub>, extinguishing powder or water jet. Fight larger fires with water jet.**5.2 Special hazards arising from the substance or mixture**Sulphur dioxide (SO<sub>2</sub>)**5.3 Advice for firefighters****Protective equipment:** Put on breathing apparatus.  
Wear full protective suit.  
Use protective measures that suit the hazard conditions.**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures**

Wear protective equipment.

**6.2 Environmental precautions:**Do not allow to enter the ground/soil.  
Do not allow to enter drainage system, surface or ground water.  
If material reaches soil inform authorities responsible for such cases.  
Inform respective authorities in case product reaches water or sewage system.**6.3 Methods and material for containment and cleaning up:**Collect mechanically.  
Dispose of contaminated material as waste according to item 13.**6.4 Reference to other sections**See Section 8 for information on personal protection equipment.  
See Section 13 for information on disposal.**SECTION 7: Handling and storage****Handling:****7.1 Precautions for safe handling**

No special precautions necessary if used correctly.

**Information about protection against explosions and fires:**

The product is not inflammable.

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**7.2 Conditions for safe storage, including any incompatibilities****Requirements to be met by storerooms and containers:**

Suitable material for containers and pipes: Plastics and steel.

**Information about storage in one common storage facility:**

Not required.

**Further information about storage conditions:**

Store under dry conditions.  
Protect from heat and direct sunlight.  
Storage temperature <30 °C

**7.3 Specific end use(s)**

There are no further specific end uses than those named in section 1.2.

**SECTION 8: Exposure controls/personal protection****Additional information about design of technical systems:**

No further data; see item 7.

**8.1 Control parameters****Components with critical values that require monitoring at the workplace:****DNELs**

Oral (Consumer): 99.6 mg/kg/d (Acute systemic effects)  
1.40 mg/kg/d (Systemic long-term effects)  
Dermal (Consumer): 6.97 mg/kg/d (Systemic long-term effects)  
(Worker): 13.95 mg/kg/d (Systemic long-term effects)

**PNECs**

Iron is an essential trace element for fish, aquatic invertebrates and plants. A direct toxicity could not be demonstrated in tests. Therefore no PNEC was derived.

**8.2 Exposure controls**

Information related to exposure control can be found in the respective exposure scenarios in the annex of the SDS.

**Personal protective equipment:  
General protective and hygienic measures:**

Listed in section 8 are the general personal protection measures corresponding to the standard of the chemical industry. Specific information and detailed requirements are referred to in the exposure scenarios in the annex of the SDS. The usual precautionary measures should be adhered to in handling the chemicals.

**Breathing equipment:**

Details can be found in the exposure scenarios in the annex of the SDS.

**Protection of hands:**

Requirements according to EN 420  
Check protective gloves prior to each use for their proper condition.  
Preventive skin protection by use of skin-protecting agents is recommended.

**Material of gloves**

Details on the material can be found in the exposure scenarios in the annex of the SDS.

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<b>Penetration time of glove material</b>	Details can be found in the exposure scenarios in the annex of the SDS.
<b>Eye protection:</b>	Tightly sealed safety glasses.
<b>Body protection:</b>	Protective work clothing.
<b>Limitation and supervision of exposure into the environment</b>	Information related to exposure control can be found in the respective exposure scenarios in the annex of the SDS.

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

<b>Form:</b>	Crystalline
<b>Colour:</b>	Greenish
<b>Smell:</b>	Odourless
<b>Odour threshold:</b>	Not determined.

**pH-value (400 g/l) at 20 °C:** 3.6**Melting point/Melting range:** ca. 64 °C  
**Boiling point/Boiling range:** Not applicable**Flash point:** Not applicable**Flammability (solid, gaseous):** Product is not inflammable.**Ignition temperature:** Not applicable**Decomposition temperature:** Not applicable**Self-flammability:** Product is not selfigniting.**Danger of explosion:** Product is not explosive.**Vapour pressure:** Not applicable.**Density:** 1.89 g/cm<sup>3</sup>**Apparent density at 20 °C:** 0.8 - 0.9 kg/l  
**Vapour density** Not applicable.  
**Evaporation rate** Not applicable.**Solubility in / Miscibility with**  
**Water at 10 °C:** 365 g/l**Partition coefficient (n-octanol/water):** Not applicable

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**Viscosity:**  
dynamic at 20 °C: 3 mPas  
(solution containing 365 g/l)

**9.2 Other information** No further relevant information available.

**SECTION 10: Stability and reactivity**

**10.1 Reactivity** The substance is stable under normal use conditions.

**10.2 Chemical stability**  
**Thermal decomposition /**  
**Conditions to be avoided:** No decomposition if used and stored according to specifications.  
Loss of constitutional water on heating

**10.3 Possibility of hazardous reactions** Not relevant

**10.4 Conditions to avoid** No further data; see item 7.

**10.5 Incompatible materials:** No further data; see item 7.

**10.6 Hazardous decomposition products:** No dangerous decomposition products known

**SECTION 11: Toxicological information****11.1 Information on toxicological effects**

**Acute toxicity:**  
**LD/LC50 values that are relevant for classification:**

Oral LD50 1096 mg/kg (rat) (OECD 423)  
Dermal LD50 >2000 mg/kg (rat) (OECD 402)  
Inhalative LC50 (-)  
no relevant data available

**Primary irritant effect:**  
**on the skin:** OECD 404:  
Irritant for skin and mucous membranes.  
**on the eye:** OECD 405:  
Irritant effect.

**Sensitisation:** OECD 429 (LLNA-test):  
No sensitizing effects.

**Subacute to chronic toxicity:**  
Oral NOAEL 274 mg/kg/d (rat) (OECD 422)

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Dermal NOAEL (-)  
no relevant data available

Inhalative NOAEC (-)  
no relevant data available

**CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**

There are no indications of CMR effects.

**Specific target organ toxicity (STOT)**

No specific target organ toxicity according to the criteria defined in Regulation (EC) No. 1272/2008.

**Aspiration hazard**

Not relevant

**SECTION 12: Ecological information****12.1 Toxicity**

Data are experimentally not accessible.  
Under standard test conditions, the ferrous ion, Fe<sup>2+</sup>, is unstable and is oxidised to the ferric, Fe<sup>3+</sup>, ion. Ferric iron salts have a high rate of conversion to insoluble ferric hydroxide, in consequence, Fe<sup>2+</sup> is to a great extent removed from the test system.  
Furthermore, iron plays an important role in biological processes, with iron homeostasis being under strict control.  
In conclusion, iron is not considered to be toxic to the aquatic environment under normal conditions.

**12.2 Persistence and degradability**

Not relevant for inorganic substances.

**12.3 Bioaccumulative potential**

Iron is a bioessential trace element for organisms and plays an important role in biological processes.  
The uptake of iron is strictly controlled by homeostatic process.  
In conclusion, bioaccumulation poses no concern.

**12.4 Mobility in soil**  
**Additional ecological information:**  
**AOX-indication:**

The substance is immobile in soil.

&lt;2 mg/kg

**12.5 Results of PBT and vPvB assessment**

The product is an inorganic substance and does not fulfill the criteria for PBZ and vPvB according to Annex XIII of REACH.

**PBT:**

Not applicable.

**vPvB:**

Not applicable.

**12.6 Other adverse effects**

No further relevant information available.

**SECTION 13: Disposal considerations****13.1 Waste treatment methods****European waste catalogue**

Waste code number according to origin of waste

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Uncleaned packagings:  
Recommendation: Disposal according to official regulations

**SECTION 14: Transport information**

14.1 UN-Number  
ADR Not dangerous according to transport specifications.  
ADN, IMDG, IATA not applicable

14.2 UN proper shipping name  
ADR, ADN, IMDG, IATA not applicable

14.3 Transport hazard class(es)  
ADR, ADN, IMDG, IATA Class not applicable

14.4 Packing group  
ADR, IMDG, IATA not applicable

14.5 Environmental hazards No environmentally hazardous substance.

14.6 Special precautions for user None

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Listed.

**SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****National regulations:**

Water hazard class: Water hazard class 1: slightly hazardous for water.

**Other regulations, limitations and prohibitive regulations to observe:**  
KRONOS Technical Information 2.02  
"Transport, Storage and Metering: Granules"

**15.2 Chemical Safety Assessment**

**Substances of very high concern (SVHC) according to REACH, Article 57**  
The product is not listed as SVHC, it does not contain any substances of very high concern.

**Chemical safety assessment:** A Chemical Safety Assessment has been carried out.

**SECTION 16: Other information**

These data are based on our present knowledge. However, they shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**Department issuing data specification sheet:** Environment & Safety

**Contact:** Michaela Müller  
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Fax: INT + 49 214 42150

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**Abbreviations and acronyms:**

e-mail: MSDS@kronosww.com

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

Acute Tox. 4: Acute toxicity, Hazard Category 4

Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2

Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2

**\* Data compared to the previous  
version altered.**

Amended according to Regulation (EU) no 431/2010

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**Annex: Exposure scenario 1****1. Short title of the exposure scenario**

ES 1: Industrial use of FERROGRANUL 20

**2. Description of activities/ process(es) covered in the Exposure Scenario**

Water treatment: treatment of waste water and WWTP sludge  
Water treatment: Use in the treatment of raw water in the supply of potable water and/or industrial process water  
H<sub>2</sub>S-Elimination in biogas and water treatment plants  
Use in manufacture of cement (reduction of chromates)  
Land remediation application  
Use in agrochemicals  
Use as laboratory reagent  
Production of mixtures and solutions

**Sector of Use**

SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites

**Process category**

PROC1 Use in closed process, no likelihood of exposure  
PROC2 Use in closed, continuous process with occasional controlled exposure  
PROC3 Use in closed batch process (synthesis or formulation)  
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises  
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  
PROC7 Industrial spraying  
PROC8b Transfer of substance or preparation (charging/discharging) from/ to vessels/large containers at dedicated facilities  
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
PROC15 Use as laboratory reagent  
PROC26 Handling of solid inorganic substances at ambient temperature

**Environmental release category**

ERC2 Formulation of preparations  
ERC4 Industrial use of processing aids in processes and products, not becoming part of articles  
ERC5 Industrial use resulting in inclusion into or onto a matrix  
ERC6b Industrial use of reactive processing aids  
ERC8a Wide dispersive indoor use of processing aids in open systems  
ERC8e Wide dispersive outdoor use of reactive substances in open systems  
ERC8d Wide dispersive outdoor use of processing aids in open systems

**3. Conditions of use****3.1 Duration and frequency Worker**

5-7 workdays/week  
Regular use with exposure up to 8 hours per workday.

**Environment**

Annual tonnage per site: up to 2000 t (Fe)

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Typical amount per lot: 25 t (product)  
Emission day per site: 365

**4. Physical parameters****4.1 Physical state**

Solid  
Granulate

**4.2 Concentration of the substance in the mixture**

Raw material.

**4.2 Concentration of substance in solution**

max. 500 g/l

**5. Other operational conditions determining exposure****5.1 Other operational conditions affecting environmental exposure**

None

**5.2 Other operational conditions affecting worker exposure**

None

**5.3 Other operational conditions affecting consumer exposure**

Not relevant for this Exposure Scenario.

**5.4 Other operational conditions affecting consumer exposure during the use of the product**

Not relevant for this Exposure Scenario.

**6.0 Risk management measures****6.1 Worker protection****6.1.1 Organisational protective measures**

Handling procedures must be well documented.  
Provide Internal Plant Instruction.  
Ensure that activities are executed by specialists or authorised personnel only.

**6.1.2 Technical protective measures**

No special precautions necessary if used correctly.

**6.1.3 Personal protective measures**

General measures corresponding to the standard of the chemical industry: see SDS section 8 .  
Material of gloves and resistance:  
Polychloroprene  
Resistance to:  
Sulphuric acid  
Value for the permeation: Level  $\geq 6$   
Respiratory protection is necessary for spray application of the product (indoors and outdoors).  
EN 149: filter FFP2

**6.2 Measures for consumer protection**

Not relevant for this Exposure Scenario.

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**6.3 Environmental protection measures****6.3.1 Air** No relevant way of exposure.**6.3.2 Water** Product is used for water treatment and is completely consumed in this application.  
Product is completely consumed in this application.**6.3.3 Soil** Product is used as part of agrochemicals.  
Product is used for soil treatment.**6.4 Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.**7. Waste related measures****7.1 Disposal procedures** Disposal according to official regulations  
Waste code number according to origin of waste**7.2 Waste type** Solid product residues  
Aqueous solution**8. Exposure estimation****Worker (oral)** No significant oral exposure**Worker (dermal)** The highest dermal exposure to the substance to be expected is 0.0017 mg/kg/day (PROC 1, 3).  
The highest dermal exposure for the substance to be expected is 0.0034 mg/kg/day (PROC 2, 5, 8b, 9)  
The highest dermal exposure for the substance to be expected is 0.017 mg/kg/day (PROC 15)  
The highest dermal exposure for the substance to be expected is 1.41 mg/kg/day (PROC 26)  
The highest dermal exposure for the substance to be expected is 3.43 mg/kg/day (PROC 4)  
The highest dermal exposure to the substance in solution to be expected is 3.43 mg/kg/day (PROC 7).  
The exposure estimation was carried out in accordance with ECETOC TRA.**Worker (inhalation)** No significant inhalative exposure**RCR (Risk Characterisation Ratio)** Risk Characterisation Ratio RCR (total) <1 (0.0001 - 0.25), safe use can be assumed if risk management measures detailed in section 6 of the annex are observed.**Environment** Since no PNECS were derived further assessment of the environmental exposure is not necessary.**Consumer** Not relevant for this Exposure Scenario.

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**9. Guidance for downstream users**

Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.

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**Annex: Exposure scenario 2****1. Short title of the exposure scenario**

ES 2: Professional use of FERROGRANUL 20

**2. Description of activities/ process(es) covered in the Exposure Scenario**

Water treatment: treatment of waste water and WWTP sludge  
Water treatment: Use in the treatment of raw water in the supply of potable water and/or industrial process water  
H<sub>2</sub>S-Elimination in biogas and water treatment plants  
Use in manufacture of cement (reduction of chromates)  
Land remediation application  
Use in agrochemicals  
Use as laboratory reagent  
Production of mixtures and solutions

**Sector of Use**

SU22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

**Process category**

PROC2 Use in closed, continuous process with occasional controlled exposure  
PROC3 Use in closed batch process (synthesis or formulation)  
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises  
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  
PROC8a Transfer of substance or preparation (charging/discharging) from/ to vessels/large containers at non-dedicated facilities  
PROC8b Transfer of substance or preparation (charging/discharging) from/ to vessels/large containers at dedicated facilities  
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
PROC11 Non industrial spraying  
PROC15 Use as laboratory reagent  
PROC19 Hand-mixing with intimate contact and only PPE available  
PROC26 Handling of solid inorganic substances at ambient temperature

**Environmental release category**

ERC2 Formulation of preparations  
ERC8a Wide dispersive indoor use of processing aids in open systems  
ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix  
ERC8d Wide dispersive outdoor use of processing aids in open systems  
ERC8e Wide dispersive outdoor use of reactive substances in open systems  
ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix

**3. Conditions of use****3.1 Duration and frequency Worker**

5 workdays/week.  
Regular use with exposure up to 8 hours per workday.

**Environment**

Annual tonnage per site: up to 1000 t (Fe)

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Typical amount per lot: 25 t (product)  
Emission day per site: 365

**4. Physical parameters****4.1 Physical state**

Solid  
Fluid

**4.2 Concentration of the substance in the mixture**

Raw material.

**4.2 Concentration of substance in solution**

max. 500 g/l

**5. Other operational conditions determining exposure****5.1 Other operational conditions affecting environmental exposure**

None

**5.2 Other operational conditions affecting worker exposure**

None

**5.3 Other operational conditions affecting consumer exposure**

Not relevant for this Exposure Scenario.

**5.4 Other operational conditions affecting consumer exposure during the use of the product**

Not relevant for this Exposure Scenario.

**6.0 Risk management measures****6.1 Worker protection****6.1.1 Organisational protective measures**

Handling procedures must be well documented.  
Provide Internal Plant Instruction.  
Ensure that activities are executed by specialists or authorised personnel only.

**6.1.2 Technical protective measures**

No special precautions necessary if used correctly.  
Ensure that suitable extractors are available on processing machines

**6.1.3 Personal protective measures**

General measures corresponding to the standard of the chemical industry:  
see SDS section 8 .  
Material of gloves and resistance:  
Polychloroprene  
Resistance to:  
Sulphuric acid  
Value for the permeation: Level  $\geq$  480 min (EN 374)  
Respiratory protection is necessary for spray application of the product (indoors and outdoors).  
EN 149: filter FFP2

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**6.2 Measures for consumer protection**

Not relevant for this Exposure Scenario.

**6.3 Environmental protection measures****6.3.1 Air**

No relevant way of exposure.

**6.3.2 Water**

Product is used for water treatment and is completely consumed in this application.

**6.3.3 Soil**Product is used as part of agrochemicals.  
Product is used for soil treatment.**6.4 Notes**

In case of unintended release of the product: See section 6 of the Safety Data Sheet.

**7. Waste related measures****7.1 Disposal procedures**Disposal according to official regulations  
Waste code number according to origin of waste**7.2 Waste type**Solid product residues  
Aqueous solution**8. Exposure estimation****Worker (oral)**

No significant oral exposure

**Worker (dermal)**

The highest dermal exposure for the substance to be expected is 0.0017 mg/kg/day (PROC 3)  
The highest dermal exposure for the substance to be expected is 0.0034 mg/kg/day (PROC 2, 5, 8b, 9)  
The highest dermal exposure to the substance to be expected is 0.017 mg/kg/day (PROC 15).  
The highest dermal exposure for the substance to be expected is 1.41 mg/kg/day (PROC 26)  
The highest dermal exposure for the substance to be expected is 3.43 mg/kg/day (PROC 4, 19)  
The highest dermal exposure for the substance to be expected is 6.86 mg/kg/day (PROC 8a)  
The highest dermal exposure to the substance in solution to be expected is 3.43 mg/kg/day (PROC 11).  
The exposure estimation was carried out in accordance with ECETOC TRA.

**Worker (inhalation)  
RCR (Risk Characterisation Ratio)**

No significant inhalative exposure

Risk Characterisation Ratio RCR (total) &lt;1 (0.0001 - 0.49), safe use can be assumed if risk management measures detailed in section 6 of the annex are observed.

**Environment**

Since no PNECS were derived further assessment of the environmental exposure is not necessary.

**Consumer**

Not relevant for this Exposure Scenario.

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**9. Guidance for downstream  
users**

Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.

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