

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**1.1 Product identifier****Commercial Product Name****KEMIRA FERIX-3** Chemical name: Diiron tris(sulphate)**Registration number:**

01-2119513202-59

1.2 Relevant identified uses of the substance or mixture and uses advised against**Use of the Substance/Mixture**

Water treatment chemical, odour control, fertilizer
ES 1., Manufacturing and generic industrial use
ES 2., Generic professional applications
ES 4., Industrial use, Professional use, Water treatment.

Recommended restrictions on use

There are no uses advised against.

1.3 Details of the supplier of the safety data sheet

Kemira Water Solutions, Inc.
1000 Parkwood Circle, Suite 500
30339 Atlanta USA
Telephone+18635335990, Telefax. +18635337077
ProductSafety.US.Lakeland@kemira.com

HEAD OFFICE
Kemira Oyj
P.O. Box 330
00101 HELSINKI
FINLAND
Telephone +358108611 Telefax +358108621124

1.4 Emergency telephone number

1-800-424-9300/1-703-527-3887 (CHEMTREC), 1-613-996-6666 (CANUTEC), For Product Information
1-800-347-1542
Carechem 24 International: +44 (0) 1235 239 670

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EU) 1272/2008(CLP)

Acute toxicity; Category 4; Harmful if swallowed.

Skin corrosion/irritation; Category 2; Causes skin irritation.

Serious eye damage/eye irritation; Category 1; Causes serious eye damage.

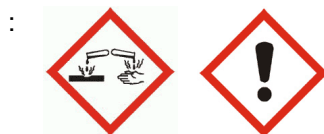
Classification according to EU Directives 67/548/EEC or 1999/45/EC

Harmful; Harmful if swallowed. Irritating to skin. Risk of serious damage to eyes.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

: Danger

Hazard statements

: H302 Harmful if swallowed.
 H315 Causes skin irritation.
 H318 Causes serious eye damage.

Precautionary statements

: P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 P264 Wash hands thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.

Response:

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.
 P310 Immediately call a POISON CENTER or doctor/ physician.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

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Hazardous components which must be listed on the label:

10028-22-5 Diiron tris(sulphate)

Further information : The product is classified and labelled in accordance with EC directives or respective national laws.

2.3 Other hazards

Advice; Aqueous solutions of the product are slightly corrosive.

Potential environmental effects; May lower the pH of water and thus be harmful to aquatic organisms.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Chemical nature of the granules mixture

CAS/EU number/REACH Registration Number	Chemical name of the substance	Concentration	Classification according to Regulation (EU) 1272/2008(CLP)	Classification according to EU Directives 67/548/EEC or 1999/45/EC
10028-22-5 233-072-9 01-2119513202-59	Diiron tris(sulphate)	66 - 74 %	Acute Tox. Category 4,H302 Eye Dam. Category 1,H318 Skin Irrit. Category 2,H315	Xn ,R22 Xi ,R38 R41
7720-78-7 231-753-5 01-2119513203-57	Iron (II) sulphate	<10 %	Acute Tox. Category 4,H302 Eye Irrit. Category 2,H319 Skin Irrit. Category 2,H315	Xn ,R22 Xi ,R36/38
7664-93-9 231-639-5 01-2119458838-20	Sulfuric acid	1 - 5 %	Skin Corr. Category 1A,H314	C ,R35
7785-87-7 232-089-9	Manganese sulphate	<2,5 %	STOT RE Category 2,H373 Aquatic Chronic Category 2,H411	Xn ,R48/20/22 N ,R51, R53 R53

Further information

For the full text of the H-Statements mentioned in this Section, see Section 16.

For the full text of the R-phrases mentioned in this Section, see Section 16.

SECTION 4: FIRST AID MEASURES**4.1 Description of first aid measures****General advice**

Show this safety data sheet to the doctor in attendance.

Inhalation

Rinse mouth and nose with water. Move to fresh air.

Skin contact

Rinse with plenty of water. If symptoms persist, call a physician.

Eye contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If possible use lukewarm water. Do not rub the eyes, mechanical irritation. Consult a physician.

Ingestion

Do NOT induce vomiting. Drink 1 or 2 glasses of water. If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : corrosive effects

Hazards : Harmful if swallowed.
Causes skin irritation.
Causes serious eye damage.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Rinse with plenty of water.
Symptomatic treatment.

SECTION 5: FIREFIGHTING MEASURES**5.1 Extinguishing media**

Extinguishing media : Not combustible.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media : No special requirements.

5.2 Special hazards arising from the substance or mixture

Heating above the decomposition temperature will release toxic gases. Sulphur oxides (SO_x)

5.3 Advice for firefighters

Exposure to decomposition products may be a hazard to health. In the event of fire, wear self-contained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

For personal protection see section 8.

6.2 Environmental precautions

Restrict the spread of the spillage by using inert absorbent material (sand, gravel). Cover the drains. Must be disposed of in accordance with local and national regulations.

6.3 Methods and materials for containment and cleaning up

Clean-up methods - small spillage

Shovel or sweep up. Must be disposed of in accordance with local and national regulations.

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Clean-up methods - large spillage

Try to keep material dry. In case of precipitation cover with a tarpaulin. Remove spill using a vacuum truck. Shovel or sweep up remaining material. Must be disposed of in accordance with local and national regulations.

6.4 Reference to other sections

Inform the rescue service in case of entry into waterways, soil or drains.

SECTION 7: HANDLING AND STORAGE**7.1 Precautions for safe handling**

Danger for slipping.

For personal protection see section 8. The work place and work methods shall be organized in such a way that direct contact with the product is prevented or minimized.

7.2 Conditions for safe storage, including any incompatibilities

Keep in a dry, cool place. Avoid high temperatures.

Keep containers tightly closed in a cool, well-ventilated place.

Materials for packaging

Suitable material: plastic (PE, PP, PVC), fiberglass-reinforced polyester, epoxy-coated concrete, titanium, acidproof or rubber-coated steel.

Materials to avoid:

Metals, Avoid contact with unalloyed steel or galvanized surfaces.

Storage stability:

Other data

Stable under normal conditions.

7.3 Specific end use(s)

Water treatment chemical, odour control

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Diiron tris(sulphate)

TWA = 1 mg/m³, inhalable dust, Calculated as Fe

TWA = 1 mg/m³, inhalable dust, Iron, : OSHA

Iron (II) sulphate

TWA = 1 mg/m³, inhalable dust, Calculated as Fe

Sulfuric acid

TWA = 0,1 mg/m³, inhalable dust, : NIOSH

STEL = 0,1 mg/m³, inhalable dust, : NIOSH

Manganese sulphate

TWA = 0,5 mg/m³, inhalable dust

nickel sulfate

TWA = 0,05 mg/m³, inhalable dust, Nickel, S: Sensitizers; Substances marked with an S can lead to very strong allergic reactions.

DNEL

Diiron tris(sulphate)

:

End Use: Workers

Exposure routes: dermal

Potential health effects: Long-term, systemic effects

Value: 2,0 mg/kg bw/day

End Use: Workers

Exposure routes: dermal

Potential health effects: Long-term, systemic effects

Value: 0,57 mg/kg bw/day

Calculated as Fe

End Use: Workers

Exposure routes: Inhalation

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Potential health effects: Long-term, systemic effects
Value: 7,2 mg/m³

End Use: Workers
Exposure routes: Inhalation
Potential health effects: Long-term, systemic effects
Value: 2,01 mg/m³
Calculated as Fe

Iron (II) sulphate

: End Use: Workers
Exposure routes: dermal
Potential health effects: Acute effects, systemic effects
Value: 1,6 mg/kg bw/day
Read-across (Analogy), CAS-No., 10025-77-1

End Use: Workers
Exposure routes: dermal
Potential health effects: Acute effects, systemic effects
Value: 0,57 mg/kg bw/day
Calculated as Fe

End Use: Workers
Exposure routes: Inhalation
Potential health effects: Acute effects, systemic effects
Value: 5,5 mg/m³
Read-across (Analogy), CAS-No., 10025-77-1

End Use: Workers
Exposure routes: Inhalation
Potential health effects: Acute effects, systemic effects
Value: 2,01 mg/m³
Calculated as Fe

End Use: Workers
Exposure routes: dermal
Potential health effects: Long-term, systemic effects
Value: 1,6 mg/kg bw/day
Read-across (Analogy), CAS-No., 10025-77-1

End Use: Workers
Exposure routes: dermal
Potential health effects: Long-term, systemic effects
Value: 0,57 mg/kg bw/day
Calculated as Fe

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End Use: Workers
Exposure routes: Inhalation
Potential health effects: Long-term, systemic effects
Value: 5,5 mg/m³
Read-across (Analogy), CAS-No., 10025-77-1

End Use: Workers
Exposure routes: Inhalation
Potential health effects: Long-term, systemic effects
Value: 2,01 mg/m³
Calculated as Fe

PNEC
Diiron tris(sulphate) : Sewage treatment plant
Value: 500 mg/l
Calculated as Fe

Iron (II) sulphate : Sewage treatment plant
Value: 500 mg/l
Calculated as Fe

8.2 Exposure controls**8.2.1 Appropriate engineering controls**

Handle in accordance with good industrial hygiene and safety practice.
Eye wash bottle or emergency eye-wash fountain must be found in the work place.
Wash hands before eating, drinking, or smoking.

8.2.2 Individual protection measures, such as personal protective equipment**Hand protection**

Glove material: Rubber or plastic gloves, Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection

Tightly fitting safety goggles. Eye wash bottle with pure water

Skin and body protection

Wear protective clothing if necessary.

Respiratory protection

Respiratory protection is not required under normal handling conditions. If aerosols or mist are formed, eg. when cleaning containers with a high pressure washer, use half mask with combination filter B/P2.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

General Information (appearance, odour)

Physical state	solid, granules
Colour	yellowbrown
Odour	not significant

Important health safety and environmental information

pH	< 2 (10 % solution)
Freezing point :	no data available
Flash point	not applicable, inorganic compound
Flammability (solid, gas)	In accordance with column 2 of REACH Annex VII, the study does not need to be conducted. Does not sustain combustion.
Explosive properties:	
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Density	1,20 - 1,40 g/cm ³
Solubility(ies):	
Water solubility	soluble
Partition coefficient: n-octanol/water	not applicable, inorganic compound
Thermal decomposition	480 °C

9.2 Other data

Corrosion

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

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Can corrode base metals in the presence of water.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

- Hazardous reactions : Corrodes metals under influence of moisture.
 : Hazardous polymerisation does not occur.

10.4 Conditions to avoid

- Conditions to avoid : Corrosion might appear in contact with moisture.
 Humidity or contact with water may cause lumpiness.

10.5 Incompatible materials

- Materials to avoid : Metals
 Avoid contact with unalloyed steel or galvanized surfaces.

10.6 Hazardous decomposition products

- Hazardous decomposition products : Thermal decomposition products:
 Sulphur oxides (SO_x).
 Thermal decomposition : 480 °C

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Harmful if swallowed.

Diiron tris(sulphate):

LD50/Oral/rat: 788 mg/kg

Remarks:Read-across (Analogy), CAS-No., 7758-94-3

LD50/Oral/rat: 220 mg/kg

Remarks:Calculated as Fe

LC50/Inhalation:

Remarks: no data available, not applicable

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LD50/Dermal/rat: > 3 154 mg/kg

Remarks: Read-across (Analogy), CAS-No., 7758-94-3

LD50/Dermal/rat: > 881 mg/kg

Remarks: Calculated as Fe

Iron (II) sulphate:

LD50/Oral/rat: 598 mg/kg

Remarks:Read-across (Analogy), CAS-No., 7758-94-3

LD50/Oral/rat: 220 mg/kg

Remarks:Calculated as Fe

LC50/Inhalation:

Remarks: no data available, not applicable

LD50/Dermal/rat: > 2 369 mg/kg

Remarks: Read-across (Analogy), CAS-No., 7758-94-3

LD50/Dermal/rat: > 881 mg/kg

Remarks: Calculated as Fe

Sulfuric acid:

LD50/Oral/rat: 2 140 mg/kg

LC50/Inhalation/4 h/rat: 0,375 mg/l

Remarks: aerosol

Although the LC50 values from the various inhalation toxicity studies performed with sulphuric acid theoretically trigger classification for Acute inhalation toxicity, classification is not proposed. The effects of sulphuric acid following inhalation are entirely due to local irritation of the respiratory tract: there is no evidence for the systemic toxicity of sulphuric acid in any study, as effects are limited to the site of contact. Classification for acute inhalation toxicity is not considered to be appropriate.

Irritation and corrosion

Skin:

Remarks: Causes skin irritation.

Eyes:

Remarks: Causes serious eye damage.

Diiron tris(sulphate):

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Skin: rabbit/OECD Test Guideline 404: No skin irritation
Moistened solid is expected to be irritant as a consequence of low pH.

Eyes: rabbit/OECD Test Guideline 405: Causes serious eye damage.
Remarks: Read-across (Analogy) 7758-94-3 dry substance
Iron (II) sulphate:

Skin: rabbit/4 h/OECD Test Guideline 404: irritating

Eyes: rabbit/OECD Test Guideline 405: slight irritation
Remarks: 25% Aqueous solution

rabbit/OECD Test Guideline 405: Corrosive
Remarks: Read-across (Analogy) CAS-No. 7758-94-3
Sulfuric acid:

Skin: Corrosive
Causes severe burns.

Eyes: Corrosive
Risk of serious damage to eyes.

Sensitisation

Diiron tris(sulphate):

According to experience sensitization is not expected.

Iron (II) sulphate:

According to experience sensitization is not expected.

Sulfuric acid:

Not sensitizing.

Long term toxicity**Diiron tris(sulphate):**

Repeated dose toxicity:

Oral/rat/males:

NOAEL: 277 mg/kg

Remarks: Read-across (Analogy)

Oral/rat/females:

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NOAEL: 314 mg/kg
Remarks: Read-across (Analogy)

Carcinogenicity

Oral/rat/2 years:
Remarks: Information given is based on data obtained from similar substances.
Not believed to be a carcinogen.

Reproductive toxicity

/rat/Reproductive effects:
NOAEL: > 500 mg/kg
NOAEL F1:
Remarks: Read-across (Analogy)

/rat/Developmental toxicity test:
NOAEL: > 1 000 mg/kg
NOAEL F1:
Remarks: Read-across (Analogy)
In animal studies, did not interfere with reproduction.

Teratogenicity

Oral/rat:
NOAEL: > 1 000 mg/kg
Did not show teratogenic effects in animal experiments. Information given is based on data obtained from similar substances.

Iron (II) sulphate:**Repeated dose toxicity:**

Oral/rat/males/OECD Test Guideline 408:
NOAEL: 277 mg/kg
Remarks: bw/day Read-across (Analogy) CAS-No. 7705-08-0

Oral/rat/females/OECD Test Guideline 408:
NOAEL: 314 mg/kg
Remarks: bw/day Read-across (Analogy) CAS-No. 7705-08-0

Carcinogenicity

Not believed to be a carcinogen.

Mutagenicity

Mutagenicity (Salmonella typhimurium - reverse mutation assay)/AMES test/OECD Test Guideline 471:
Result: negative
Metabolic activation: with and without
Remarks: Read-across (Analogy) CAS-No. 7758-94-3

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Reproductive toxicity

/Reproductive effects/OECD Test Guideline 422:

NOAEL: > 1 000 mg/kg

NOAEL F1: > 1 000 mg/kg

Remarks: bw/day

Sulfuric acid:

Repeated dose toxicity:

Inhalation/rat/28 d:

NOAEL: = 0,0003 mg/l

Carcinogenicity

Inhalation/rat:

Did not show carcinogenic effects in animal experiments.

Oral/mouse:

Weak local carcinogen.

Mutagenicity

mammalian cells (CHO)/Chromosome aberration test in vitro:

Result: positive

Metabolic activation: with and without

Due to its pH.

Salmonella typhimurium (bacterium)/Ames test:

Result: negative

Metabolic activation: with and without

Reproductive toxicity

/rabbit/Developmental toxicity test:

NOEL: = 0,020 mg/l

Did not show teratogenic effects in animal experiments.

Human experience

Inhalation

Symptoms: Inhalation may provoke the following symptoms:, cough and difficulties in breathing

Skin contact

Symptoms: Repeated or prolonged skin contact may cause:, dry skin, irritation

Eye contact

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Symptoms: Contact with eyes causes a smarting pain and a flood of tears.

Remarks: The product may harm the cornea by mechanical action.

Ingestion

Symptoms: Ingestion may provoke the following symptoms:;, irritation of mouth, oesophagus and stomach, nausea, vomiting

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Aquatic toxicity

—

Diiron tris(sulphate):

LC50/96 h/Oncorhynchus mykiss (rainbow trout): > 100 mg/l

NOEC/90 d/Oncorhynchus kisutch (Coho salmon): > 1 mg/l

EC50/48 h/Daphnia: 82,8 mg/l

NOEC/21 d/Daphnia magna (Water flea): > 1 mg/l

The compound is considered to have no long term effects in aquatic systems due to the rapid formation of insoluble hydroxides.

Iron (II) sulphate:

LC50/96 h/Oncorhynchus mykiss (rainbow trout)/OECD Test Guideline 203: 82,4 mg/l

NOEC/90 d/Oncorhynchus kisutch (Coho salmon): > 1 mg/l

EC50/48 h/Invertebrates./OECD Test Guideline 202: 16 - 110 mg/l

NOEC/21 d/Daphnia magna (Water flea)/OECD Test Guideline 202: > 1 mg/l

The compound is considered to have no long term effects in aquatic systems due to the rapid formation of insoluble hydroxides.

Sulfuric acid:

LC50/96 h/Lepomis macrochirus (bluegill sunfish)/static test: 16 - 28 mg/l

fresh water

EC50/48 h/Daphnia magna (Water flea)/static test/OECD Test Guideline 202: > 100 mg/l

fresh water

EC50/72 h/Desmodesmus subspicatus (green algae)/static test/OECD Test Guideline 201: > 100 mg/l

Remarks: May be harmful to aquatic organisms because of the low pH value.

Toxicity to other organisms

No data is available on the product itself.

Iron (II) sulphate:

Remarks: no data available

Sulfuric acid:

NOEC/37 d/active sludge/static test: 26 g/l
fresh water

NOEC/30 d/active sludge/static test: > 30 g/l
fresh water

12.2 Persistence and degradability

Chemical degradation:

Remarks: When reacting with water precipitates of iron hydroxides are formed., This mainly occurs at pH above 5.

Biological degradability:**Diiron tris(sulphate):**

The methods for determining the biological degradability are not applicable to inorganic substances.

Iron (II) sulphate:

The methods for determining the biological degradability are not applicable to inorganic substances.

Sulfuric acid:

The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water: not applicable, inorganic compound

Diiron tris(sulphate):

Does not bioaccumulate.

Partition coefficient: n-octanol/water: not applicable, inorganic compound

Iron (II) sulphate:

The product is not expected to bioaccumulate.
Partition coefficient: n-octanol/water: not applicable, inorganic compound

Sulfuric acid:

Does not bioaccumulate.

12.4. Mobility in soil**Mobility**

Water solubility: soluble

12.5. Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6 Other adverse effects

May lower the pH of water and thus be harmful to aquatic organisms.

SECTION 13: DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods****Product**

Classified as hazardous waste. Must be disposed of in accordance with local and national regulations.
Thoroughly cleaned packaging material may be recycled.

Contaminated packaging

Classified as hazardous waste. Must be disposed of in accordance with local and national regulations.

SECTION 14: TRANSPORT INFORMATION**14.1 UN number****Land transport**

Not classified as dangerous in the meaning of transport regulations.

Sea transport

Not classified as dangerous in the meaning of transport regulations.

Air transport

Not classified as dangerous in the meaning of transport regulations.

14.6 Special precautions for user

SECTION 15: REGULATORY INFORMATION**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

- Other regulations : All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) or are not required to be listed on EINECS.
- : No restrictions identified other than those already covered in regulations.

Notification status

- : All components of this product are included in the United States TSCA Chemical Inventory or are not required to be listed on the United States TSCA Chemical Inventory.
- : All components of this product are included in the Canada Domestic Substance List (DSL) or are not required to be listed on the Canada Domestic Substance List (DSL).
- : All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) or are not required to be listed on EINECS.
- :

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for the main component.

SECTION 16: OTHER INFORMATION**Full text of H-Statements referred to under section 3.**

H302	Harmful if swallowed.
H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H314	Causes severe skin burns and eye damage.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

Text of R-phrases mentioned in Section 3

R22	Harmful if swallowed.
R38	Irritating to skin.

R41	Risk of serious damage to eyes.
R22	Harmful if swallowed.
R36/38	Irritating to eyes and skin.
R35	Causes severe burns.
R48/20/22	Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R51	Toxic to aquatic organisms.
R53	May cause long-term adverse effects in the aquatic environment.
R53	May cause long-term adverse effects in the aquatic environment.

Training advice

Read the safety data sheet before using the product.

Further information

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

Sources of key data used to compile the Safety Data Sheet

Regulations, databases, literature, own tests.

Additions, Deletions, Revisions

Relevant changes have been marked with vertical lines.

Annex**Contents: Exposure scenario****1. Manufacturing and generic industrial use, Manufacturing of solid chemical**

SU 3; SU8, SU9, SU 10, SU13, SU14, SU15, SU16, SU19, SU24; ERC1, ERC2, ERC4, ERC5, ERC6a, ERC6b, ERC8f, ERC10a; PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15, PROC22, PROC26; AC4, AC7, AC8, AC11, AC13

2. Manufacturing and generic industrial use, Manufacturing of liquid chemical

SU 3; SU8, SU9, SU10, SU13, SU14, SU15, SU16, SU19, SU24; ERC1, ERC2, ERC4, ERC5, ERC6a, ERC6b, ERC8f, ERC10a; PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC15; AC4, AC7, AC8, AC11, AC13

3. Generic professional applications

SU 22; SU1, SU10, SU13, SU19, SU24; ERC2, ERC8a, ERC8c, ERC8d, ERC8e, ERC8f, ERC10a; PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC11, PROC14, PROC15, PROC22, PROC26; AC4, AC7, AC8, AC11, AC13

4. Generic professional applications, Aqueous solution

SU 22; SU1, SU13, SU19, SU24; ERC8a, ERC8c, ERC8d, ERC8e, ERC8f, ERC10a; PROC1, PROC2, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC15, PROC19; AC4, AC7, AC8, AC11, AC13

5. Consumer use

SU 21; ERC8a, ERC8c, ERC8d, ERC8f; PC9b, PC12, PC14; AC4, AC7, AC8, AC11, AC13

6. Consumer use, Aqueous solution

SU 21; ERC8a, ERC8c, ERC8d, ERC8f, ERC10a; PC14; AC4, AC7, AC8, AC11, AC13

1. Short title of Exposure Scenario: Manufacturing and generic industrial use, Manufacturing of solid chemical

- Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites

- Sector of use : **SU8:** Manufacture of bulk, large scale chemicals (including petroleum products)
SU9: Manufacture of fine chemicals
SU 10: Formulation
SU13: Manufacture of other non-metallic mineral products, e.g. plasters, cement
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
SU19: Building and construction work
SU24: Scientific research and development

- 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)
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation
PROC15: Use as laboratory reagent
PROC22: Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting
PROC26: Handling of solid inorganic substances at ambient temperature

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-
- Article category : **AC4:** Stone, plaster, cement, glass and ceramic articles
AC7: Metal articles
AC8: Paper articles
AC11: Wood articles
AC13: Plastic articles
- Environmental release category : **ERC1:** Manufacture of substances
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
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b: Industrial use of reactive processing aids
ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix
ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2, ERC4, ERC5, ERC6a, ERC6b, ERC8f, ERC10a

Frequency and duration of use/exposure from service life

Continuous exposure : 365 days/year

Environment factors not influenced by risk management

Dilution Factor (River) : 40
Dilution Factor (Coastal Areas) : 400
Remarks : In water iron salts immediately dissociate into the respective ions.

Technical conditions and measures / Organizational measures

Air : Wet scrubber for dust elimination of waste gases

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2 000 m³/d
Procedures to limit air emissions from Sewage Treatment Plant :
Remarks : Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP

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exposure is considered negligible and with no risk.

2.2 Contributing scenario controlling worker exposure for: PROC1

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

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

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

2.3 Contributing scenario controlling worker exposure for: PROC2

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day

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Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

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

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

2.4 Contributing scenario controlling worker exposure for: PROC3

Product (article) characteristic

Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min

Frequency of use : < 220 days/year

Human factors not influenced by risk managementExposed skin area : Palm of one hand (240 cm²)Breathing volume : 10 m³/8h-day**Other operational conditions affecting workers exposure**

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

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

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

2.5 Contributing scenario controlling worker exposure for: PROC4

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

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Exposure duration : > 240 min
 Frequency of use : < 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
 Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 90 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.6 Contributing scenario controlling worker exposure for: PROC5

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
 Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
 Frequency of use : < 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
 Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 90 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.7 Contributing scenario controlling worker exposure for: PROC8a

Product (article) characteristic

Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposureExposure duration : > 240 min
Frequency of use : < 220 days/year**Human factors not influenced by risk management**Exposed skin area : Both hands (960 cm²)
Breathing volume : 10 m³/8h-day**Other operational conditions affecting workers exposure**

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 95 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.8 Contributing scenario controlling worker exposure for: PROC8b

Product (article) characteristicRemarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High**Frequency and duration of use/exposure**Exposure duration : > 240 min
Frequency of use : < 220 days/year**Human factors not influenced by risk management**Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day**Other operational conditions affecting workers exposure**

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

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Local exhaust ventilation (Effectiveness: 95 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.9 Contributing scenario controlling worker exposure for: PROC9

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : < 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 90 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.10 Contributing scenario controlling worker exposure for: PROC14

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : < 220 days/year

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Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 90 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.11 Contributing scenario controlling worker exposure for: PROC15

Product (article) characteristic

Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : < 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 90 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.12 Contributing scenario controlling worker exposure for: PROC22

Product (article) characteristic

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Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : < 220 days/year

Human factors not influenced by risk management

Exposed skin area : Both hands and forearms (1980 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 90 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.13 Contributing scenario controlling worker exposure for: PROC26

Product (article) characteristic

Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : < 220 days/year

Human factors not influenced by risk management

Exposed skin area : Both hands and forearms (1980 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor and outdoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 82 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

(Effectiveness: 90 %)If above technical/organisational control measures are not feasible, then adopt following PPE:, Wear respiratory protection.

3. Exposure estimation and reference to its source
Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio:
PROC1	MEASE		Worker - inhalative, long-term - systemic	0,01 mg/m ³	
PROC1	MEASE		Worker - dermal, long-term - systemic	0,0017 mg/kg bw/day	0,000171
PROC2	MEASE		Worker - inhalative, long-term - systemic	1 mg/m ³	
PROC2	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,000343
PROC3	MEASE		Worker - inhalative, long-term - systemic	1 mg/m ³	
PROC3	MEASE		Worker - dermal, long-term - systemic	0,0017 mg/kg bw/day	0,00017
PROC4	MEASE		Worker - inhalative, long-term - systemic	2,5 mg/m ³	
PROC4	MEASE		Worker - dermal, long-term - systemic	0,3429 mg/kg bw/day	0,0343
PROC5	MEASE		Worker - inhalative, long-term - systemic	2,5 mg/m ³	
PROC5	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,000034
PROC8a	MEASE		Worker - inhalative, long-term - systemic	2,5 mg/m ³	
PROC8a	MEASE		Worker - dermal, long-term - systemic	0,6857 mg/kg bw/day	0,0686

			term - systemic		
PROC8b	MEASE		Worker - inhalative, long- term - systemic	1,25 mg/m ³	
PROC8b	MEASE		Worker - dermal, long- term - systemic	0,0034 mg/kg bw/day	0,000034
PROC9	MEASE		Worker - inhalative, long- term - systemic	2 mg/m ³	
PROC9	MEASE		Worker - dermal, long- term - systemic	0,0034 mg/kg bw/day	0,000034
PROC14	MEASE		Worker - inhalative, long- term - systemic	1 mg/m ³	
PROC14	MEASE		Worker - dermal, long- term - systemic	0,0034 mg/kg bw/day	0,000034
PROC15	MEASE		Worker - inhalative, long- term - systemic	0,5 mg/m ³	
PROC15	MEASE		Worker - dermal, long- term - systemic	0,0171 mg/kg bw/day	0,00017
PROC22	MEASE		Worker - inhalative, long- term - systemic	0,7 mg/m ³	
PROC22	MEASE		Worker - dermal, long- term - systemic	0,1414 mg/kg bw/day	0,00141
PROC26	MEASE		Worker - inhalative, long- term - systemic	1,8 mg/m ³	
PROC26	MEASE		Worker - dermal, long- term - systemic	1,4143 mg/kg bw/day	0,0707

This substance is corrosive. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Therefore, dermal exposure to this substance was not quantified. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels., If scaling reveals a condition of unsafe use (i.e. RCRs>1), additional RMMs or a site-specific chemical safety assessment is required.

1. Short title of Exposure Scenario: Manufacturing and generic industrial use, Manufacturing of liquid chemical

- Main User Groups : **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
- 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 (excluding alloys)
SU13: Manufacture of other non-metallic mineral products, e.g. plasters, cement
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
SU19: Building and construction work
SU24: Scientific research and development
- 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
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)
PROC10: Roller application or brushing
PROC12: Use of blowing agents in manufacture of foam
PROC13: Treatment of articles by dipping and pouring
PROC15: Use as laboratory reagent

Article category	: AC4: Stone, plaster, cement, glass and ceramic articles AC7: Metal articles AC8: Paper articles AC11: Wood articles AC13: Plastic articles
Environmental release category	: ERC1: Manufacture of substances 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 ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6b: Industrial use of reactive processing aids ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2, ERC4, ERC5, ERC6a, ERC6b, ERC8f, ERC10a

Frequency and duration of use/exposure from service life

Continuous exposure : 365 days/year

Environment factors not influenced by risk management

Dilution Factor (River)	: 40
Dilution Factor (Coastal Areas)	: 400
Remarks	: In water iron salts immediately dissociate into the respective ions.

Technical conditions and measures / Organizational measures

Air : Wet scrubber for dust elimination of waste gases

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	: 2 000 m ³ /d
Procedures to limit air emissions from Sewage Treatment Plant	:
Remarks	: Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk.

2.2 Contributing scenario controlling worker exposure for: PROC1

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

2.3 Contributing scenario controlling worker exposure for: PROC2

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

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Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

2.4 Contributing scenario controlling worker exposure for: PROC3

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

2.5 Contributing scenario controlling worker exposure for: PROC4

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

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Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.6 Contributing scenario controlling worker exposure for: PROC5

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.7 Contributing scenario controlling worker exposure for: PROC7

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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Technical conditions and measures

Local exhaust ventilation (Effectiveness: 95 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.8 Contributing scenario controlling worker exposure for: PROC8a

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Both hands (960 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %)

2.9 Contributing scenario controlling worker exposure for: PROC8b, PROC9

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)

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Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.10 Contributing scenario controlling worker exposure for: PROC10

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min

Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)

Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.11 Contributing scenario controlling worker exposure for: PROC12

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min

Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)

Breathing volume : 10 m³/8 hours

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Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.12 Contributing scenario controlling worker exposure for: PROC13

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.13 Contributing scenario controlling worker exposure for: PROC15

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)
Breathing volume : 10 m³/8 hours

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Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.14 Contributing scenario controlling worker exposure for: PROC19

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio:
PROC1	MEASE		Worker - inhalative, long-term - systemic	0,001 mg/m ³	
PROC1	MEASE		Worker - dermal, long-term - systemic	0,0017 mg/kg bw/day	0,000171
PROC2	MEASE		Worker - inhalative, long-term - systemic	0,001 mg/m ³	

PROC2	MEASE		Worker - dermal, long- term - systemic	0,0034 mg/kg bw/day	0,000343
PROC3	MEASE		Worker - inhalative, long- term - systemic	0,01 mg/m ³	
PROC3	MEASE		Worker - dermal, long- term - systemic	0,0017 mg/kg bw/day	0,000171
PROC4	MEASE		Worker - inhalative, long- term - systemic	0,05 mg/m ³	
PROC4	MEASE		Worker - dermal, long- term - systemic	0,3429 mg/kg bw/day	0,0343
PROC5	MEASE		Worker - inhalative, long- term - systemic	0,05 mg/m ³	
PROC5	MEASE		Worker - dermal, long- term - systemic	0,0034 mg/kg bw/day	0,000034
PROC7	MEASE		Worker - inhalative, long- term - systemic	20 mg/m ³	
PROC7	MEASE		Worker - dermal, long- term - systemic	0,3429 mg/kg bw/day	0,0343
PROC8a	MEASE		Worker - inhalative, long- term - systemic	0,05 mg/m ³	
PROC8a	MEASE		Worker - dermal, long- term - systemic	0,6857 mg/kg bw/day	0,0686
PROC8b, PROC9	MEASE		Worker - inhalative, long- term - systemic	0,01 mg/m ³	
PROC8b, PROC9	MEASE		Worker - dermal, long- term - systemic	0,0034 mg/kg bw/day	0,000034
PROC10	MEASE		Worker - inhalative, long- term - systemic	0,05 mg/m ³	
PROC10	MEASE		Worker - dermal, long- term - systemic	0,1714 mg/kg bw/day	0,0171
PROC12	MEASE		Worker -	0,001 mg/m ³	

			inhalative, long-term - systemic		
PROC12	MEASE		Worker - dermal, long-term - systemic	0,0017 mg/kg bw/day	0,000017
PROC13	MEASE		Worker - inhalative, long-term - systemic	0,01 mg/m ³	
PROC13	MEASE		Worker - dermal, long-term - systemic	0,0343 mg/kg bw/day	0,000343
PROC15	MEASE		Worker - inhalative, long-term - systemic	0,01 mg/m ³	
PROC15	MEASE		Worker - dermal, long-term - systemic	0,0171 mg/kg bw/day	0,000171
PROC19	MEASE		Worker - inhalative, long-term - systemic	0,05 mg/m ³	
PROC19	MEASE		Worker - dermal, long-term - systemic	0,3429 mg/kg bw/day	0,0343

This substance is corrosive. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Therefore, dermal exposure to this substance was not quantified., When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels., If scaling reveals a condition of unsafe use (i.e. RCRs>1), additional RMMs or a site-specific chemical safety assessment is required.

1. Short title of Exposure Scenario: Generic professional applications

- Main User Groups : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
- Sector of use : **SU1:** Agriculture, forestry, fishery
SU10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
SU13: Manufacture of other non-metallic mineral products, e.g. plasters, cement
SU19: Building and construction work
SU24: Scientific research and development
- 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)
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
PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation
PROC15: Use as laboratory reagent
PROC22: Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting
PROC26: Handling of solid inorganic substances at ambient temperature
- Article category : **AC4:** Stone, plaster, cement, glass and ceramic articles
AC7: Metal articles
AC8: Paper articles
AC11: Wood articles
AC13: Plastic articles

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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
ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release

2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC8a, ERC8c, ERC8d, ERC8e, ERC8f, ERC10a

Frequency and duration of use/exposure from service life

Continuous exposure : 365 days/year

Environment factors not influenced by risk management

Dilution Factor (River) : 40
Dilution Factor (Coastal Areas) : 400
Remarks : In water iron salts immediately dissociate into the respective ions.

Technical conditions and measures / Organizational measures

Air : Wet scrubber for dust elimination of waste gases

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2 000 m³/d
Procedures to limit air emissions from Sewage Treatment Plant :
Remarks : Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk.

2.2 Contributing scenario controlling worker exposure for: PROC1

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Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid, high dustiness

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

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

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

2.3 Contributing scenario controlling worker exposure for: PROC2

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid, high dustiness

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

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Local exhaust ventilation (Effectiveness: 80 %)

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

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

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

2.4 Contributing scenario controlling worker exposure for: PROC3, PROC15

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid, high dustiness

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 80 %)

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

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

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

2.5 Contributing scenario controlling worker exposure for: PROC4

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

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Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor activities

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 80 %)

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

Wear respiratory protection. (Effectiveness: 90 %)Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %)

2.6 Contributing scenario controlling worker exposure for: PROC5, PROC8b

Product (article) characteristic

Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor activities

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 80 %)

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

Wear respiratory protection. (Effectiveness: 90 %)

2.7 Contributing scenario controlling worker exposure for: PROC8a

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

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Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposureExposure duration : > 240 min
Frequency of use : 220 days/year**Human factors not influenced by risk management**Exposed skin area : Both hands (960 cm²)
Breathing volume : 10 m³/8h-day**Other operational conditions affecting workers exposure**

Outdoor / Indoor : Indoor activities

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 80 %)

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

Wear respiratory protection. (Effectiveness: 90 %)Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %)

2.9 Contributing scenario controlling worker exposure for: PROC9

Product (article) characteristic

Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposureExposure duration : > 240 min
Frequency of use : 220 days/year**Human factors not influenced by risk management**Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day**Other operational conditions affecting workers exposure**

Outdoor / Indoor : Indoor activities

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 80 %)

Conditions and measures related to personal protection, hygiene and health evaluationIf above technical/organisational control measures are not feasible, then adopt following PPE:Wear respiratory protection.

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2.10 Contributing scenario controlling worker exposure for: PROC11

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor activities

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 80 %)

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

Wear respiratory protection. (Effectiveness: 90 %)Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %)

2.11 Contributing scenario controlling worker exposure for: PROC14

Product (article) characteristic

Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor activities

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 80 %)

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

Wear respiratory protection. (Effectiveness: 90 %)

2.12 Contributing scenario controlling worker exposure for: PROC22

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid, high dustiness

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Both hands and forearms (1980 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor
Outdoor / Indoor : Indoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 90 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %) If above technical/organisational control measures are not feasible, then adopt following PPE: Wear respiratory protection.

2.13 Contributing scenario controlling worker exposure for: PROC26

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Solid substance, Dustiness: High

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Both hands and forearms (1980 cm²)
Breathing volume : 10 m³/8h-day

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor activities

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 77 %)

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

If above technical/organisational control measures are not feasible, then adopt following PPE:, Wear respiratory protection.Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %)

3. Exposure estimation and reference to its source
Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio:
PROC1	MEASE		Worker - inhalative, long-term - systemic	0,01 mg/m ³	
PROC1	MEASE		Worker - dermal, long-term - systemic	0,0017 mg/kg bw/day	0,000171
PROC2	MEASE		Worker - inhalative, long-term - systemic	1 mg/m ³	
PROC2	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,000343
PROC3, PROC15	MEASE		Worker - inhalative, long-term - systemic	1 mg/m ³	
PROC3, PROC15	MEASE		Worker - dermal, long-term - systemic	0,0017 mg/kg bw/day	0,000171
PROC4	MEASE		Worker - inhalative, long-term - systemic	1 mg/m ³	
PROC4	MEASE		Worker - dermal, long-term - systemic	3,4286 mg/kg bw/day	0,0343
PROC5,	MEASE		Worker -	1 mg/m ³	

PROC8b			inhalative, long-term - systemic		
PROC5, PROC8b	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,000343
PROC8a	MEASE		Worker - inhalative, long-term - systemic	1 mg/m ³	
PROC8a	MEASE		Worker - dermal, long-term - systemic	0,6857 mg/kg bw/day	0,0686
PROC9	MEASE		Worker - inhalative, long-term - systemic	4 mg/m ³	
PROC9	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,000343
PROC11	MEASE		Worker - inhalative, long-term - systemic	0,4 mg/m ³	
PROC11	MEASE		Worker - dermal, long-term - systemic	0,3429 mg/kg bw/day	0,0343
PROC14	MEASE		Worker - inhalative, long-term - systemic	1 mg/m ³	
PROC14	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,00343
PROC22	MEASE		Worker - inhalative, long-term - systemic	0,7 mg/m ³	
PROC22	MEASE		Worker - dermal, long-term - systemic	0,1414 mg/kg bw/day	0,00174
PROC26	MEASE		Worker - inhalative, long-term - systemic	4,6 mg/m ³	
PROC26	MEASE		Worker - dermal, long-term - systemic	1,4143 mg/kg bw/day	0,0707

This substance is corrosive. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Therefore, dermal exposure to this substance was not quantified., When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels., For scaling see: <http://www.ecetoc.org/tra>, If scaling reveals a condition of unsafe use (i.e. RCRs>1), additional RMMs or a site-specific chemical safety assessment is required.

1. Short title of Exposure Scenario: Generic professional applications, Aqueous solution

- Main User Groups : **SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
- Sector of use : **SU1:** Agriculture, forestry, fishery
SU13: Manufacture of other non-metallic mineral products, e.g. plasters, cement
SU19: Building and construction work
SU24: Scientific research and development
- Process category : **PROC1:** Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
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)
PROC10: Roller application or brushing
PROC11: Non industrial spraying
PROC13: Treatment of articles by dipping and pouring
PROC15: Use as laboratory reagent
PROC19: Hand-mixing with intimate contact and only PPE available
- Article category : **AC4:** Stone, plaster, cement, glass and ceramic articles
AC7: Metal articles
AC8: Paper articles
AC11: Wood articles
AC13: Plastic articles
- Environmental release category : **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

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in open systems

ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8c, ERC8d, ERC8e, ERC8f, ERC10a

Frequency and duration of use/exposure from service life

Continuous exposure : 365 days/year

Environment factors not influenced by risk management

Dilution Factor (River) : 40

Dilution Factor (Coastal Areas) : 400

Remarks : In water iron salts immediately dissociate into the respective ions.

Other given operational conditions affecting environmental exposure

Continuous exposure

Number of emission days per year : 365

Technical conditions and measures / Organizational measures

Air : Wet scrubber for dust elimination of waste gases

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2 000 m³/d

Procedures to limit air emissions from Sewage Treatment Plant :

Remarks : Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk.

2.2 Contributing scenario controlling worker exposure for: PROC2

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Physical Form (at time of use) : Aqueous solution

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Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Utilize a closed system process where feasible. Where a closed system is not used, good enclosure and local exhaust ventilation should be provided to minimize exposure.

2.3 Contributing scenario controlling worker exposure for: PROC5

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

2.4 Contributing scenario controlling worker exposure for: PROC8a

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

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Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Both hands (960 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.5 Contributing scenario controlling worker exposure for: PROC8b, PROC9

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

2.6 Contributing scenario controlling worker exposure for: PROC10

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

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Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)

2.7 Contributing scenario controlling worker exposure for: PROC11

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Local exhaust ventilation (Effectiveness: 80 %)

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

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
(Effectiveness: 90 %)Wear respiratory protection. (Effectiveness: 90 %)If above technical/organisational control measures are not feasible, then adopt following PPE:

2.9 Contributing scenario controlling worker exposure for: PROC13

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

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Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palms of both hands (480 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

2.10 Contributing scenario controlling worker exposure for: PROC15

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Palm of one hand (240 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

2.11 Contributing scenario controlling worker exposure for: PROC19

Product (article) characteristic

Remarks : Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use) : Aqueous solution

Frequency and duration of use/exposure

Exposure duration : > 240 min
Frequency of use : 220 days/year

Human factors not influenced by risk management

Exposed skin area : Both hands and forearms (1980 cm²)
Breathing volume : 10 m³/8 hours

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

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

 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
 (Effectiveness: 95 %)

3. Exposure estimation and reference to its source
Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio:
PROC2	MEASE		Worker - inhalative, long-term - systemic	0,001 mg/m ³	
PROC2	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,000343
PROC5	MEASE		Worker - inhalative, long-term - systemic	0,1 mg/m ³	
PROC5	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,000343
PROC8a	MEASE		Worker - inhalative, long-term - systemic	0,05 mg/m ³	
PROC8a	MEASE		Worker - dermal, long-term - systemic	0,6857 mg/kg bw/day	0,0686
PROC8b, PROC9	MEASE		Worker - inhalative, long-term - systemic	0,05 mg/m ³	
PROC8b, PROC9	MEASE		Worker - dermal, long-term - systemic	0,0034 mg/kg bw/day	0,000343
PROC10	MEASE		Worker - inhalative, long-term - systemic	0,05 mg/m ³	
PROC10	MEASE		Worker - dermal, long-term - systemic	0,3429 mg/kg bw/day	0,0343

PROC11	MEASE		Worker - inhalative, long- term - systemic	0,4 mg/m ³	
PROC11	MEASE		Worker - dermal, long- term - systemic	0,3429 mg/kg bw/day	0,0343
PROC13	MEASE		Worker - inhalative, long- term - systemic	0,05 mg/m ³	
PROC13	MEASE		Worker - dermal, long- term - systemic	0,0343 mg/kg bw/day	0,00343
PROC15	MEASE		Worker - inhalative, long- term - systemic	0,01 mg/m ³	
PROC15	MEASE		Worker - dermal, long- term - systemic	0,0171 mg/kg bw/day	0,000171
PROC19	MEASE		Worker - inhalative, long- term - systemic	0,05 mg/m ³	
PROC19	MEASE		Worker - dermal, long- term - systemic	1,4143 mg/kg bw/day	0,0707

This substance is corrosive. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Therefore, dermal exposure to this substance was not quantified. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. For scaling see: <http://www.ecetoc.org/tra>, If scaling reveals a condition of unsafe use (i.e. RCRs>1), additional RMMs or a site-specific chemical safety assessment is required.

KEMIRA FERIX-3

Ref. 1.0/CH/EN

Revision Date: 10.12.2014

Previous date: 00.00.0000

Print Date:20.05.2015

1. Short title of Exposure Scenario: Consumer use

Main User Groups	: SU 21: Consumer uses: Private households (= general public = consumers)
Product category	: PC9b: Fillers, putties, plasters, modelling clay PC12: Fertilizers PC14: Metal surface treatment products, including galvanic and electroplating products
Article category	: AC4: Stone, plaster, cement, glass and ceramic articles AC7: Metal articles AC8: Paper articles AC11: Wood articles AC13: Plastic articles
Environmental release category	: 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 ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8c, ERC8d, ERC8e, ERC8f, ERC10a

Product characteristics

Concentration of the Substance in Mixture/Article	: - 100 % Covers the percentage of the substance in the product up to 100 % (unless stated differently).
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Environment factors not influenced by risk management

Dilution Factor (River)	: 40
Dilution Factor (Coastal Areas)	: 400
Remarks	: In water iron salts immediately dissociate into the respective ions.

Other given operational conditions affecting environmental exposure

Continuous exposure	
Number of emission days per year	: 365

KEMIRA FERIX-3

Ref. 1.0/CH/EN

Revision Date: 10.12.2014

Previous date: 00.00.0000

Print Date:20.05.2015

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant
 Flow rate of sewage treatment : 2 000 m³/d
 plant effluent
 Procedures to limit air emissions :
 from Sewage Treatment Plant
 Remarks : Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk.

2.2 Contributing scenario controlling consumer exposure for: PC9b, PC12, PC14

Product (article) characteristic

Covers percentage substance in the product up to 1 %.

Physical Form (at time of use) : Solid, high dustiness

Amount used

Amount used per event : 500 kg

Frequency and duration of use/exposure from service : 60 min

life Application duration

Human factors not influenced by risk management

Body weight : 60 kg

Breathing volume : 0,083 m³/h

3. Exposure estimation and reference to its source

Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	RCR
PC9b PC12 PC14		Material transfers, Mixing operations (open systems)	Consumer - dermal, long-term - systemic	0,57 mg/kg bw/day	0,141
PC9b PC12 PC14		Material transfers, Mixing operations (open systems)	Consumer - inhalative, short-term - systemic	0,63 mg/m ³	

PC9b PC12 PC14		Material transfers, Mixing operations (open systems)	Consumer - inhalative, long- term - systemic	0,027 mg/m ³	
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When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e. RCRs>1), additional RMMs or a site-specific chemical safety assessment is required.

1. Short title of Exposure Scenario: Consumer use, Aqueous solution

Main User Groups	: SU 21: Consumer uses: Private households (= general public = consumers)
Product category	: PC14: Metal surface treatment products, including galvanic and electroplating products
Article category	: AC4: Stone, plaster, cement, glass and ceramic articles AC7: Metal articles AC8: Paper articles AC11: Wood articles AC13: Plastic articles
Environmental release category	: 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 ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8c, ERC8d, ERC8e, ERC8f, ERC10a

Product characteristics

Concentration of the Substance in Mixture/Article	: - 100 %
	Covers the percentage of the substance in the product up to 100 % (unless stated differently).

Environment factors not influenced by risk management

Dilution Factor (River)	: 40
Dilution Factor (Coastal Areas)	: 400
Remarks	: In water iron salts immediately dissociate into the respective ions.

Other given operational conditions affecting environmental exposure

Continuous exposure	
Number of emission days per year	: 365

KEMIRA FERIX-3

Ref. 1.0/CH/EN

Revision Date: 10.12.2014

Previous date: 00.00.0000

Print Date:20.05.2015

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant : Municipal sewage treatment plant
 Flow rate of sewage treatment plant effluent : 2 000 m³/d
 Procedures to limit air emissions from Sewage Treatment Plant :
 Remarks : Substance will disassociate upon contact with water, the only effect is the pH effect, therefore after passing through the STP exposure is considered negligible and with no risk.

2.2 Contributing scenario controlling consumer exposure for: PC14

Product (article) characteristic

Covers percentage substance in the product up to 40 %.
 Physical Form (at time of use) : Aqueous solution

Amount used

Amount used per event : 0,5 kg

Frequency and duration of use/exposure from service life: Application duration : 1,33 min

Human factors not influenced by risk management

Body weight : 60 kg
 Breathing volume : 1,446 m³/h

Other given operational conditions affecting consumers exposure from article service life: Room size : 1 m³

Ventilation rate per hour : 0,6

Release area : 20 cm²

3. Exposure estimation and reference to its source

Consumers

Contributing	Exposure Assessment	Specific conditions	Value type	Level of	RCR
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Scenario	Method			Exposure	
PC14	ConsExpo (v4.1)	Dipping, immersion and pouring	Consumer - inhalative, short-term - systemic	0,000057 mg/m ³	
PC14	ConsExpo (v4.1)	Dipping, immersion and pouring	Consumer - dermal, long-term - systemic	0,067 mg/kg bw/day	0,0165

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. If scaling reveals a condition of unsafe use (i.e. RCRs>1), additional RMMs or a site-specific chemical safety assessment is required.