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

- **1.1 Product identifier**
- **Trade name Zitronensäure Mono Standard**
- **Article number:** 1000316141002
- **CAS Number:**5949-29-1
- **REACh-Registration number** 01-2119457026-42

- **1.2 Relevant identified uses of the substance or mixture and uses advised against**
For details on the identifiable uses according to EC-regulation No. 1907/2006 see annex of this safety data sheet.
- **Application of the substance / the mixture**
Basic chemical (without special defined application)
Food additive
Cosmetic auxiliary
Industrial / Professional use
Metal surface treatment

- **1.3 Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Deckma Hamburg GmbH
Kieler Str. 316
D-22525 Hamburg
Phone: + 49(0)40548876 -0
Fax: + 49 (0)40548876-10
- **Informing department:**
Product safety department. Tel.: 0049 / 521 / 3037-162, 3037-311 or 3037-328
E-mail: ehs-bielefeld@stockmeier.de

- **1.4 Emergency telephone number:**
National Poisons Information Service (NPIS) - Emergency call (healthcare professionals): (+44) 844 892 0111 - 0344 892 0111

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**
Eye Irrit. 2 H319 Causes serious eye irritation.

- **2.2 Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The substance is classified and labelled according to the CLP regulation.
- **Hazard pictograms**

GHS07
- **Signal word** Warning
- **Hazard statements**
H319 Causes serious eye irritation.
- **Precautionary statements**
P264 Wash hands thoroughly after handling.
P280 Wear eye protection / face protection.

(Contd. on page 2)

(Contd. of page 1)

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.

- **2.3 Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

- **3.1 Substances** 2-hydroxypropane-1,2,3-tricarbolic acid monohydrate
- **CAS No. Designation:**
5949-29-1 citric acid monohydrate
- **Identification no(s):** 201-069-1
- **Additonal information:** EEC Food additive: E 330

SECTION 4: First aid measures

- **4.1 Description of first aid measures**
- **General advice:** In case of unconsciousness bring patient into stable side position for transport.
- **After inhalation**
Supply fresh air; consult doctor in case of symptoms.
After inhaling the product-dust, breathe in plenty of fresh air.
Consult a doctor.
- **After skin contact**
Instantly wash with water and soap and rinse thoroughly. If skin irritation persists, seek medical advice.
- **After eye contact**
Rinse immediately opened eye for several minutes under running water. Then consult doctor.
Rinse opened eye for several minutes under running water. If symptoms persist, consult doctor.
- **After swallowing**
Rinse out mouth and then drink plenty of water.
Seek medical treatment.

- **4.2 Most important symptoms and effects, both acute and delayed**
No further relevant information available.

- **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

SECTION 5: Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents** Use fire fighting measures that suit the environment.
- **5.2 Special hazards arising from the substance or mixture**
Can be released in case of fire:
carbon monoxide (CO)
carbon dioxide (CO2)
- **5.3 Advice for firefighters**
- **Protective equipment:**
Wear self-contained breathing apparatus.
Wear full protective suit with self-contained breathing apparatus.

(Contd. on page 3)

(Contd. of page 2)

- **Additional information** Collect contaminated fire fighting water separately. It must not enter drains.

* SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures**
Avoid contact with skin, eyes and clothes.
Wear protective equipment and keep unprotected persons away.
Do not breathe dust.
- **6.2 Environmental precautions:**
Damp down dust with water spray jet.
Do not allow to enter drainage system, surface or ground water.
If large amounts are released, the authorities must be informed.

- **6.3 Methods and material for containment and cleaning up:**
Pick up mechanically and rinse the remainder with water. Avoid dust development. Place in suitable container and send to be recycled or disposed of (taking item 13 into account).

- **6.4 Reference to other sections**
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

* SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**
Avoid contact with eyes or skin.
Do not breathe dust.
Keep containers tightly sealed.
Ensure good ventilation/exhaustion at the workplace. Avoid repeated or long-term skin contact.
Prevent formation of dust.
When preparing solutions, always stirr product into water.
- **Information about protection against explosions and fires:**
Organic solids: dust can form an explosive mixture with air.
Keep ignition sources away - Do not smoke.
Avoid dust formation. Dustexplosion class ST 1

- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage** Store in cool, dry conditions in well sealed containers.
- **Requirements to be met by storerooms and containers:**
Observe official regulations on storage and handling of water harzardous substances
Provide acid-resistant floor.
Keep container tightly closed and dry
- **Information about storage in one common storage facility:** Store away from oxidising agents.
- **Further information about storage conditions:**
Protect from humidity and keep away from water.
Store under dry conditions.
Keep container tightly sealed.
- **Storage class** 11
- **7.3 Specific end use(s)** No further relevant information available.

* SECTION 8: Exposure controls/personal protection

- **Additional information about design of technical systems:**
In case of dust development, suction is needed.

(Contd. on page 4)

(Contd. of page 3)

- **8.1 Control parameters**

- **Components with critical values that require monitoring at the workplace:** Not required.
- **DNELs** No DNEL value has been established.

- **PNECs**	
PNEC water	440 mg/l (water)
PNEC sediment	3.46 mg/kg dw (freshwater) 34.6 mg/kg dw (Seawater)
PNEC soil	33.1 mg/kg dw (soil)
PNEC STP	>1,000 mg/l (sewage plant)

- **Additional information:** The lists that were valid during the compilation were used as basis.

- **8.2 Exposure controls**
- **Personal protective equipment**
- **General protective and hygienic measures**
Keep away from food, beverages and fodder.
Instantly remove any soiled and impregnated garments.
Wash hands during breaks and at the end of the work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Do not inhale dust. Prevent formation of dust.
Gases, fumes and aerosols should not be inhaled.
- **Breathing equipment:** Breathing protection to be used where a build-up of dust occurs.
- **Recommended filter device for short term use:**
Filter P2
Take care of limitations and rules for the use of breathing protection equipment (BGR 190).
- **Protection of hands:**
Protective gloves.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- **Material of gloves**
Nitrile rubber, NBR, recommended thickness of the material: ≥ 0.11 mm, penetration time: ≥ 480 min.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:** Tightly sealed safety glasses.
- **Body protection:**
Acid resistant protective clothing
Standard protective working clothes, chemical resistant safety-shoes or wellingtons. If skin contact is possible, wear impenetrable protective clothing.
Standard protective working clothes.

(Contd. on page 5)

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* SECTION 9: Physical and chemical properties

- 9.1 Information on basic physical and chemical properties **- General Information** **- Appearance:**	
Form:	Powder
Colour:	White
- Smell:	Odourless
- Odour threshold:	Not determined
- pH-value:	1.8
- Change in condition	
Melting point/freezing point:	151-157 °C
Initial boiling point and boiling range:	135-153 °C
- Flash point:	345 °C
- Inflammability (solid, gaseous)	Product is not inflammable.
- Ignition temperature:	345 °C
- Decomposition temperature:	> 170 °C
- Self-inflammability:	Not determined.
- Explosive properties:	Product is not potentially explosive
	Organic solids: dust can form an explosive mixture with air.
- Critical values for explosion:	
Lower:	Not determined
Upper:	Not determined
- Vapour pressure:	Not applicable.
- Density at 20 °C	~1.5 g/cm³
- Settled apparent density	900 kg/m³
- Relative density	Not determined
- Vapour density	Not determined
- Evaporation rate	Not determined
- Solubility in / Miscibility with	
Water at 20 °C:	600 g/l
- Partition coefficient: n-octanol/water:	Not determined.
- Viscosity:	
dynamic:	Not determined
kinematic:	Not determined
- 9.2 Other information	No further relevant information available.

* SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**

No decomposition if used and stored according to specifications.

- **10.3 Possibility of hazardous reactions** Corrosive action on metals
- **10.4 Conditions to avoid** No further relevant information available.

(Contd. on page 6)

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- **10.5 Incompatible materials:**
Strong bases
strong oxidizing agents
- **10.6 Hazardous decomposition products:** No dangerous decomposition products known

* SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity** Based on available data, the classification criteria are not met.

- **LD/LC50 values that are relevant for classification:**		
Oral	LD50	3,000 mg/kg (rat)

- **Primary irritant effect:**
- **Skin corrosion/irritation** Slight irritant, but not sufficient to trigger an EC label.
- **Serious eye damage/irritation**
Causes serious eye irritation.
- **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
- **Other information (about experimental toxicology):** Mutagenicity: AMES: negative
- **Subacute to chronic toxicity:**

- **STOT-repeated exposure:**		
Oral	NOAEL	1,200 mg/kg (rat)

- **Additional toxicological information:** irritant
- **CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)**
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

- **12.1 Toxicity**

- **Aquatic toxicity:**	
LC 50 / 96 h	440-760 mg/l (Leuciscus idus) (OECD 203)
EC 50 / 72 h	120 mg/l (Daphnia magna)

- **12.2 Persistence and degradability**
The product is readily biodegradable.

Biodegradability	97 % (OECD 301 B) (28 d) 98 % (Zahn-Wellens-Test (OECD 302 B))

- **12.3 Bioaccumulative potential**
Due to the distribution coefficient n-octanol/water an accumulation in organisms is not expected.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
Do not allow to enter drainage system, surface or ground water
Water hazard class 1 (Assessment by list): slightly hazardous for water.
Rinse off of bigger amounts into drains or the aquatic environment may lead to decreased pH-values. A low pH-value harms aquatic organisms. In the dilution of the use-level the pH-value is considerablyincreased, so that after the use of the product the aqueous waste, emptied into drains, is only low water-dangerous.

(Contd. on page 7)

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- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

* SECTION 13: Disposal considerations

- **13.1 Waste treatment methods**
The following advice is related to new material and not to any processed products. In case of a mixture with other products other disposal methods may become necessary. If in doubt seek advice from product supplier or from local authorities.
- **Recommendation**
The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Waste disposal key number:**
Since 01/01/99 the waste code numbers have not only been product-related but are also essentially application-related. The valid waste code number of the application can be obtained from the European waste catalogue.
- **Uncleaned packagings:** Disposal must be made according to official regulations.
- **Recommendation:**
Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning.
After complete emptying and cleaning, send to be reconditioned or recycled.
Rented packaging: After optimal emptying, close immediately and return to the supplier without cleaning.
Care should be taken that no other materials get into the packaging.
Other containers: After complete emptying and cleaning, send to be reconditioned or recycled.
- **Recommended cleaning agent:**
Water
Water, if necessary with cleaning agent.

SECTION 14: Transport information

- **14.1 UN-Number**	
- **ADR, IMDG, IATA**	Void
- **14.2 UN proper shipping name**	
- **ADR, IMDG, IATA**	Void
- **14.3 Transport hazard class(es)**	
- **ADR**	
- **Class**	Void
- **Label** -	
- **IMDG, IATA**	
- **Class**	Void
- **14.4 Packing group**	
- **ADR, IMDG, IATA**	Void
- **14.5 Environmental hazards:**	Not applicable.
- **Marine pollutant:**	No

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- **14.6 Special precautions for user**	Not applicable.
- **14.7 Transport in bulk according to Annex II of Marpol and the IBC Code**	Not applicable.
- **Transport/Additional information:**	Not dangerous according to the above specifications.
- **UN "Model Regulation":**	Void

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Labelling according to Regulation (EC) No 1272/2008**

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

- **Hazard pictograms**

GHS07

- **Signal word** Warning
- **Hazard statements**

H319 Causes serious eye irritation.

- **Precautionary statements**

P264 Wash hands thoroughly after handling.
P280 Wear eye protection / face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.

- **National regulations**
- **Information about limitation of use:**

Employment restrictions concerning young persons must be observed.

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

SECTION 16: Other information

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

- **Department issuing data specification sheet:** see item 1: Informing department
- **Contact:**

Frau S. Ademoglu
Frau L. Hüser
Herr G. März

- **Abbreviations and acronyms:**

NOAEL: No Observed Adverse Effect Level
RPE: Respiratory Protective Equipment
RCR: Risk Characterisation Ratio (RCR= PEC/PNEC)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
CLP: Classification, Labelling and Packaging (Regulation (EC) No. 1272/2008)
CAS: Chemical Abstracts Service (division of the American Chemical Society)

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TRGS: Technische Regeln für Gefahrstoffe (Technical Rules for Dangerous Substances, BAuA, Germany)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
- *** Data compared to the previous version altered.**
- **ANNEX**

Exposure Scenarios:
Use as an intermediate
Use in formulation.
Use in Metal surface treatment
Use for water treatment
Use as laboratory chemical.
Use in cleaning agents
Where appropriate for industry, commerce and consumers

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* Annex: Exposure scenario 1

- **Short title of the exposure scenario**

Use as an intermediate
Industrial

- **Sector of Use**

SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
SU9 Manufacture of fine chemicals

- **Product category** PC19 Intermediate
- **Process category**

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

- **Environmental release category** ERC6a Use of intermediate
- **Description of the activities / processes covered in the Exposure Scenario**

See section 1 of the annex to the Safety Data Sheet.

- **Conditions of use**
- **Duration and frequency** 5 workdays/week.
- **Worker**

Covers annual application up to: 300 day / year
1 application(s) / day

- **Environment**

Emission Days (days/year): 300
Annual quantity in the EU: 100 000 t/a
Fraction of EU tonnage used in region: 3 000 t/a
Fraction of Regional tonnage used Locally: 10 t/a
Annual site tonnage (tonnes/year): 3 000

- **Physical parameters**
- **Physical state**

Solid in various forms
Powder
Crystalline

- **Concentration of the substance in the mixture** Raw material.
- **Other operational conditions**
- **Other operational conditions affecting environmental exposure**

Local freshwater dilution factor: 40
Release fraction to air from process (initial release prior to RMM): 0 kg/kg
Release fraction to wastewater from process (initial release prior to RMM): 0.007 kg/kg

- **Other operational conditions affecting worker exposure**

Palm of one hand (240 cm^2): PROC1, PROC3
Palm of both hands (480 cm^2): PROC2, PROC4, PROC8b
Avoid contact with eyes.

- **Other operational conditions affecting consumer exposure** No special measures required.
- **Other operational conditions affecting consumer exposure during the use of the product**

Not applicable.

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- **Risk management measures**
For following contributing scenarios: handle only in a place equipped with local exhaust (or other appropriate exhaust) (90% effectiveness): PROC2, PROC3, PROC4
For following contributing scenarios: handle only in a place equipped with local exhaust (or other appropriate exhaust) (95% effectiveness): PROC8a
- **Worker protection**
- **Organisational protective measures** Keep good industrial hygiene.
- **Technical protective measures** Ensure that suitable extractors are available on processing machines
- **Personal protective measures**
Breathing protection to be used where a build-up of dust occurs.
Protective gloves.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Nitrile rubber, NBR, recommended thickness of the material: ⍰ 0.11 mm, penetration time: ⍰ 480 min.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Tightly sealed safety glasses.
Acid resistant protective clothing
Standard protective working clothes, chemical resistant safety-shoes or wellingtons. If skin contact is possible, wear impenetrable protective clothing.
Standard protective working clothes
Do not inhale dust / smoke / mist.
Avoid contact with the eyes.
Tightly sealed safety glasses.
- **Measures for consumer protection** Ensure adequate labelling.
- **Environmental protection measures**
- **Water**
Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required.
All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Size of sewage treatment plant (m^3/d): 10 000
- **Disposal measures**
The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
Ensure that waste is collected and contained.
- **Disposal procedures**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Waste type** Partially emptied and uncleaned packaging
- **Exposure estimation** The exposure estimation was carried out in accordance with ECETOC TRA.
- **Worker (dermal)**
mg/kg/d
PROC1: 0,3 *PROC3: 0,03 (LEV)* *PROC8b: 0,69 (LEV)*
PROC2: 0,14 (LEV) *PROC4: 0,69 (LEV)*

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- **Worker (inhalation)**
mg/kg /d
PROC1: 0,001
PROC2: 0,01 (LEV)
PROC3: 0,01 (LEV)
PROC4: 0,36 (LEV)
PROC8b: 0,18 (LEV)
- **Environment**
The estimation of environmental exposure was carried out in accordance with EUSES.
The highest environmental exposure to be expected for surface waters is 0.0154 mg / L.
- **Consumer** Not relevant for this Exposure Scenario.
- **Guidance for downstream users** No further relevant information available.

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* Annex: Exposure scenario 2

- **Short title of the exposure scenario**

Use in formulation.
Industrial

- **Sector of Use**

SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU5 Manufacture of textiles, leather, fur
SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU13 Manufacture of other non-metallic mineral products, e.g. plasters, cement
SU20 Health services

- **Product category**

PC1 Adhesives, sealants
PC3 Air care products
PC9a Coatings and paints, thinners, paint removers
PC9b Fillers, putties, plasters, modelling clay
PC9c Finger paints
PC12 Fertilisers
PC18 Ink and toners
PC30 Photo chemicals
PC31 Polishes and wax blends
PC35 Washing and cleaning products (including solvent based products)
PC39 Cosmetics, personal care products

- **Process category**

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises
PROC5 Mixing or blending in batch processes
PROC7 Industrial spraying
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC13 Treatment of articles by dipping and pouring
PROC14 Tabletting, compression, extrusion, pelletisation, granulation
PROC15 Use as laboratory reagent
PROC19 Manual activities involving hand contact

- **Environmental release category**

ERC1 Manufacture of the substance
ERC2 Formulation into mixture
ERC3 Formulation into solid matrix
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

- **Conditions of use**
- **Duration and frequency**
- **Worker:** Covers annual application up to: 300 day / year

1 application(s) / day

- **Environment:** Emission Days (days/year): 300

Annual quantity in the EU: 150 000 t/a

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Fraction of EU tonnage used in region: 6 000 t/a
Regional use tonnage (tonnes/year): 15000
Annual site tonnage (tonnes/year): 20
- **Physical parameters**
- **Physical state**
Solid in various forms
Powder, Crystalline
Volatility: high
Volatility: low (PROC13, PROC19)
- **Other operational conditions**
- **Other operational conditions affecting environmental exposure**
Release fraction to air from process (initial release prior to RMM): 0.0025
Release fraction to wastewater from process (initial release prior to RMM): 0.0005
- **Other operational conditions affecting worker exposure**
Palm of one hand (240 cm^2): PROC1, PROC3, PROC15
Palm of both hands (480 cm^2): PROC2, PROC4, PROC5, PROC8b, PROC9, PROC13, PROC14
Both hands (820 cm^2): PROC8a, -
Hands and forearms (1500 cm^2): PROC7, -
More than hands and forearms (1980 cm^2): PROC19, -
- **Risk management measures**
For following contributing scenarios: handle only in a place equipped with local exhaust (or other appropriate exhaust) (90% effectiveness): PROC2, PROC3, PROC4, PROC5
PROC7, PROC8a, PROC8b, PROC9, PROC13, PROc14, PROC15, PROC19
- **Worker protection**
- **Organisational protective measures** Keep good industrial hygiene.
- **Personal protective measures**
Breathing protection to be used where a build-up of dust occurs.
Protective gloves.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation Nitrile rubber, NBR, recommended thickness of the material: ≥ 0.11 mm, penetration time: ≥ 480 min.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Tightly sealed safety glasses.
Standard protective working clothes, chemical resistant safety-shoes or wellingtons. If skin contact is possible, wear impenetrable protective clothing.
Acid resistant protective clothing
- **Environmental protection measures**
- **Water**
Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required. All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Size of sewage treatment plant (m^3/d): 10 000
- **Disposal measures**
The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.
- **Exposure estimation** The exposure estimation was carried out in accordance with ECETOC TRA.
- **Worker (dermal)**
mg/kg/d
PROC1: 0,34

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PROC2: 0,14
PROC3: 0,034
PROC4: 0,69
PROC5: 1,37
PROC7: 4,29
PROC8a: 1,37
PROC8b: 0,69
PROC9: 0,69
PROC13: 0,69
PROC14: 0,34
PROC15: 0,34
PROC19: 14,1

- **Worker (inhalation)**

mg/kg /d
PROC1: 0,0014
PROC2: 0,014
PROC3: 0,014
PROC4: 0,36
PROC5: 0,36
PROC7: 1,43
PROC8a: 0,71
PROC8b: 0,36
PROC9: 0,29
PROC13: 0,0014
PROC14: 0,14
PROC15: 0,071
PROC19: 0,0071

- **Environment**

The estimation of environmental exposure was carried out in accordance with EUSES.
The highest environmental exposure to be expected for surface waters is 0.0154 mg / L.

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* Annex: Exposure scenario 3

- **Short title of the exposure scenario**

Use in Metal surface treatment
Industrial

- **Sector of Use**

SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU14 Manufacture of basic metals, including alloys
SU15 Manufacture of fabricated metal products, except machinery and equipment
SU16 Manufacture of computer, electronic and optical products, electrical equipment
SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

- **Product category**

PC7 Base metals and alloys
PC14 Metal surface treatment products
PC25 Metal working fluids
PC31 Polishes and wax blends
PC35 Washing and cleaning products (including solvent based products)

- **Process category**

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises
PROC7 Industrial spraying
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC10 Roller application or brushing
PROC13 Treatment of articles by dipping and pouring
PROC17 Lubrication at high energy conditions in metal working operations
PROC18 General greasing /lubrication at high kinetic energy conditions
PROC23 Open processing and transfer operations at substantially elevated temperature

- **Environmental release category**

ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article)

- **Conditions of use**
- **Physical parameters**
- **Physical state** mixture
- **Used amount per time or activity** 1000 tons per year
- **Risk management measures** Ensure sufficient ventilation at risk of aerosol or vapor formation.
- **Worker protection**
- **Organisational protective measures** Keep good industrial hygiene.
- **Personal protective measures**

Breathing protection to be used where a build-up of dust occurs.
Protective gloves.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Nitrile rubber, NBR, recommended thickness of the material: ⍰ 0.11 mm, penetration time: ⍰ 480 min.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

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Tightly sealed safety glasses.
Standard protective working clothes, chemical resistant safety-shoes or wellingtons. If skin contact is possible, wear impenetrable protective clothing.
Acid resistant protective clothing
- **Environmental protection measures**
- **Water**
Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required.
All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
- **Disposal measures**
The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.
- **Exposure estimation** no data available
- **Environment** no data available

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* Annex: Exposure scenario 4

- **Short title of the exposure scenario**

Use for water treatment
Industrial

- **Sector of Use**

SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU14 Manufacture of basic metals, including alloys
SU15 Manufacture of fabricated metal products, except machinery and equipment
SU16 Manufacture of computer, electronic and optical products, electrical equipment
SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment

- **Product category**

PC4 Anti-Freeze and de-icing products
PC7 Base metals and alloys
PC14 Metal surface treatment products
PC16 Heat transfer fluids
PC17 Hydraulic fluids
PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents
PC25 Metal working fluids
PC31 Polishes and wax blends
PC35 Washing and cleaning products (including solvent based products)
PC37 Water treatment chemicals

- **Process category**

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises
PROC7 Industrial spraying
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC10 Roller application or brushing
PROC13 Treatment of articles by dipping and pouring
PROC17 Lubrication at high energy conditions in metal working operations
PROC18 General greasing /lubrication at high kinetic energy conditions
PROC20 Use of functional fluids in small devices
PROC23 Open processing and transfer operations at substantially elevated temperature

- **Environmental release category**

ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC7 Use of functional fluid at industrial site

- **Conditions of use**
- **Physical parameters**
- **Physical state** mixture
- **Used amount per time or activity** 1000 tons per year
- **Risk management measures** Ensure sufficient ventilation at risk of aerosol or vapor formation.
- **Worker protection**
- **Organisational protective measures** Keep good industrial hygiene.

(Contd. on page 19)

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- **Personal protective measures**
Breathing protection to be used where a build-up of dust occurs.
Protective gloves.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Nitrile rubber, NBR, recommended thickness of the material: ≥ 0.11 mm, penetration time: ≥ 480 min.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Tightly sealed safety glasses.
Standard protective working clothes, chemical resistant safety-shoes or wellingtons. If skin contact is possible, wear impenetrable protective clothing.
Acid resistant protective clothing
- **Environmental protection measures**
- **Water**
Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required.
All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
- **Disposal measures**
The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.

- **Exposure estimation** no data available
- **Environment**
Exposure estimation:
Release fraction to wastewater from wide dispersive use:
0.1 x 1000 tpa x 1000 kg/t / 365 = 274 kg/day (regional surface water)
0.9 x 1000 tpa x 1000 kg/t / 365 = 2470 kg/day (continental surface water)

(Contd. on page 20)

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* Annex: Exposure scenario 5

- **Short title of the exposure scenario**

Use as laboratory chemical.
Industrial

- **Sector of Use** SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
- **Product category**

PC4 Anti-Freeze and de-icing products
PC16 Heat transfer fluids
PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents
PC37 Water treatment chemicals

- **Process category**

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4 Chemical production where opportunity for exposure arises
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

- **Environmental release category**

ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC7 Use of functional fluid at industrial site
ERC8f Widespread use leading to inclusion into/onto article (outdoor)

- **Conditions of use**
- **Physical parameters**
- **Physical state** mixture
- **Used amount per time or activity** 1000 tons per year
- **Risk management measures** Ensure sufficient ventilation at risk of aerosol or vapor formation.
- **Worker protection**
- **Organisational protective measures** Keep good industrial hygiene.
- **Personal protective measures**

Breathing protection to be used where a build-up of dust occurs.
Protective gloves.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Nitrile rubber, NBR, recommended thickness of the material: ⍰ 0.11 mm, penetration time: ⍰ 480 min.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Tightly sealed safety glasses.
Standard protective working clothes, chemical resistant safety-shoes or wellingtons. If skin contact is possible, wear impenetrable protective clothing.
Acid resistant protective clothing

- **Environmental protection measures**
- **Water**

Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required. All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

- **Disposal measures**

The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.

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- **Exposure estimation** no data available
- **Environment** no data available

(Contd. on page 22)

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* Annex: Exposure scenario 6

- **Short title of the exposure scenario**

Use in cleaning agents
Industrial

- **Sector of Use** SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
- **Product category**

PC3 Air care products
PC28 Perfumes, fragrances
PC31 Polishes and wax blends
PC35 Washing and cleaning products (including solvent based products)
PC36 Water softeners
PC37 Water treatment chemicals

- **Process category**

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC4 Chemical production where opportunity for exposure arises
PROC7 Industrial spraying
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC10 Roller application or brushing
PROC13 Treatment of articles by dipping and pouring

- **Article category**

AC8 Paper articles
AC35 Scented paper articles

- **Environmental release category**

ERC2 Formulation into mixture
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC9a Widespread use of functional fluid (indoor)
ERC9b Widespread use of functional fluid (outdoor)

- **Conditions of use**
- **Duration and frequency**
- **Worker**

Covers annual application up to: 365 day / year
1 application(s) / day

- **Environment**

Emission Days (days/year): 365
Annual quantity in the EU: 100 000 t/a
Fraction of EU tonnage used in region: 10%
Regional use tonnage (tonnes/year): 10 000
Fraction of Regional tonnage used Locally: 200 t/d
Annual site tonnage (tonnes/year): 10 kg/d

- **Physical parameters**
- **Physical state**

Granulate
In water
Volatility: low
Volatility: High (PROC7)

- **Concentration of the substance in the mixture** Aqueous solutions containing 25 up to 100% of the solid form.

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- **Other operational conditions**
- **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100
Release fraction to air from process (initial release prior to RMM): 0
Release fraction to wastewater from process (initial release prior to RMM): 1
- **Other operational conditions affecting worker exposure**
Palm of both hands (480 cm^2): PROC8b, PROC9, PROC13
Both hands (960 cm^2): PROC8a, PROC10
Hands and forearms (1500 cm^2): PROC7, -
- **Risk management measures**
For following contributing scenarios: handle only in a place equipped with local exhaust (or other appropriate exhaust) (95% effectiveness): PROC7
- **Worker protection**
- **Organisational protective measures** Keep good industrial hygiene.
- **Personal protective measures**
Breathing protection to be used where a build-up of dust occurs.
Protective gloves.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Nitrile rubber, NBR, recommended thickness of the material: ≥ 0.11 mm, penetration time: ≥ 480 min.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Tightly sealed safety glasses.
Standard protective working clothes, chemical resistant safety-shoes or wellingtons. If skin contact is possible, wear impenetrable protective clothing.
Acid resistant protective clothing
- **Environmental protection measures**
- **Water**
Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required. All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Assumed domestic sewage treatment plant flow: 2000 m3/d
- **Disposal measures**
The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.
- **Exposure estimation** The exposure estimation was carried out in accordance with ECETOC TRA.
- **Worker (dermal)**
mg/kg/d
PROC7: 2,14
PROC8a: 13,7
PROC8b: 6,9
PROC9: 6,9
PROC10: 27,4
PROC13: 13,7
- **Worker (inhalation)**
mg/kg /d
PROC7: 0,71
PROC8a: 0,07

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PROC8b: 0,014
PROC9: 0,01
PROC10: 0,07
PROC13: 0,014
- **Environment** The estimation of environmental exposure was carried out in accordance with EUSES.

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* Annex: Exposure scenario 7

- **Short title of the exposure scenario**

Use in cleaning agents
Professional

- **Sector of Use**

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

- **Product category**

PC3 Air care products
PC28 Perfumes, fragrances
PC31 Polishes and wax blends
PC35 Washing and cleaning products (including solvent based products)
PC36 Water softeners
PC37 Water treatment chemicals

- **Process category**

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC4 Chemical production where opportunity for exposure arises
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC9 Transfer of substance or mixture 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
PROC19 Manual activities involving hand contact

- **Article category**

AC8 Paper articles
AC35 Scented paper articles

- **Environmental release category**

ERC2 Formulation into mixture
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC9a Widespread use of functional fluid (indoor)
ERC9b Widespread use of functional fluid (outdoor)

- **Conditions of use**
- **Duration and frequency**
- **Worker**

Covers annual application up to: 365 day / year
1 application(s) / day
Exposure duration per day: 1 application per day 15 min. (Laundry and dish-washing products)
Exposure duration per day: 1 application per day 30 min (Automotive Care Products)

- **Environment**

Emission Days (days/year): 365
Annual quantity in the EU: 100 000 t/a
Fraction of EU tonnage used in region: 10%
Regional use tonnage (tonnes/year): 10 000
Fraction of Regional tonnage used Locally: 200 t/d
Annual site tonnage (tonnes/year): 10 kg/d

- **Physical parameters**
- **Physical state**

Granulate
In water Volatility: low

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- **Concentration of the substance in the mixture**
Aqueous solutions containing 25 up to 100% of the solid form.
- **Used amount per time or activity** 10 kg per day
- **Other operational conditions**
- **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100
- **Other operational conditions affecting worker exposure**
Palm of both hands (480 cm^2): PROC9, -
Both hands (960 cm^2): PROC8a, PROC10
Hands and forearms (1500 cm^2): PROC11, -
More than hands and forearms (1980 cm^2): PROC19, -
liquid preparations: pH control.
Granular solid.: During application, the product does not form dust.

- **Risk management measures**
- **Worker protection**
- **Personal protective measures**
For more information on "Personal protective equipment" see section 8 of the MSDS
- **Environmental protection measures**
- **Water**
Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required.
All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
- **Disposal measures**
The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.

- **Exposure estimation** The exposure estimation was carried out in accordance with ECETOC TRA.
- **Worker (dermal)**
mg/kg/d
PROC8a: 13,7
PROC9: 6,86
PROC10: 27,4
PROC11: 107
PROC19: 141
- **Worker (inhalation)**
mg/kg /d
PROC8a: 0,07
PROC9: 0,07
PROC10: 0,07
PROC11: 0,14
PROC19: 0,07
- **Environment** The estimation of environmental exposure was carried out in accordance with EUSES.

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* Annex: Exposure scenario 8

- **Short title of the exposure scenario**

Use in cleaning agents
consumer

- **Sector of Use** SU21 Consumer uses: Private households / general public / consumers
- **Product category**

PC3 Air care products
PC28 Perfumes, fragrances
PC31 Polishes and wax blends
PC35 Washing and cleaning products (including solvent based products)
PC36 Water softeners
PC37 Water treatment chemicals

- **Article category**

AC8 Paper articles
AC35 Scented paper articles

- **Environmental release category**

ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC9a Widespread use of functional fluid (indoor)
ERC9b Widespread use of functional fluid (outdoor)

- **Conditions of use**
- **Duration and frequency**
- **Environment**

Emission Days (days/year): 365
Annual quantity in the EU: 100 000 t/a
Fraction of EU tonnage used in region: 10%
Regional use tonnage (tonnes/year): 10 000
Fraction of Regional tonnage used Locally: 200 t/d
Annual site tonnage (tonnes/year): 10 kg/d
Fraction of main source to local environment: 0.0005

- **Physical parameters**
- **Physical state**

Granulate
In water

- **Concentration of the substance in the mixture**

Aqueous solutions containing 25 up to 100% of the solid form.

- **Other operational conditions**
- **Other operational conditions affecting environmental exposure**

Local freshwater dilution factor: 10
Local marine water dilution factor: 100

- **Other operational conditions affecting worker exposure**

Both hands (960 cm^2): -, -
liquid preparations: pH control.
Granular solid.: During application, the product does not form dust.

- **Other operational conditions affecting consumer exposure**

Body weight: Default 65 kg
Respiration volume under conditions of use: Default: 26 m3
Room size: 20 m3
Ventilation rate: 0.6 hours

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- **Risk management measures**
- **Worker protection**
- **Personal protective measures**

For more information on "Personal protective equipment" see section 8 of the MSDS

- **Environmental protection measures**
- **Water**

Generally, prior to the introduction of wastewater into wastewater treatment plants a neutralisation is required.
All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

- **Disposal measures**

The administrative regulations to be observed for the disposal
Can be deposited with household garbage after consulting with the operator of the waste disposal facility and the pertinent authorities and under adherence to the necessary technical regulations.

- **Exposure estimation** no data available
- **Environment** no data available