# Citric acid Anhydrous

# EXTENDED SAFETY DATA SHEET

**ACCORDING TO EC-REGULATIONS 1907/2006 (REACH); 1272/2008 & 453/2010 (CLP)**

**Version: 1**
**Date: 28/02/2011**

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

**1.1 Product identifier**

| | |
|---|---|
| Chemical Name | Citric acid |
| Trade name | Citric acid Anhydrous |
| CAS No. | 77-92-9 |
| EINECS No. | 201-069-1 |
| REACH Registration No. | 01-2119457026-42-0006 |

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

| | |
|---|---|
| Identified use(s) | Used as a sour agent, buffering agent and antioxidant in the food industry; a correctant in pharmaceutical industry; used in detergents, buffering and chelating, sizing and as a sequestrant. |
| Uses advised against | No uses advised against |

**1.3 Details of the supplier of the Safety Data Sheet**

| | |
|---|---|
| Company Identification | Weifang Ensign Industry Co., Ltd.<br>No.1567, Changsheng Street, Changle, Weifang, Shandong Province, China. |
| Telephone | 0086-536-6298125 |
| Fax No | 0086-536-6234587 |
| Contact name | Wei Liu |
| Email | sales@ensignworld.com |
| EU Only Representative | B-Lands Consulting<br>WTC, 5 Place Robert Schuman, BP 1516, 38025 Grenoble, France |
| Telephone: | +33 476 295 869 |
| Fax: | +33 476 295 870 |
| Email: | clients@reachteam.eu |
| contact person: | Dr. Michael J Kilner |

1.4 Emergency telephone number for United Kingdom +44 1235 239 670

Opening hours

## SECTION 2: HAZARDS IDENTIFICATION

**2.1 Classification of the substance or mixture**

**2.1.1 Regulation (EC) No. 1272/2008 (CLP)** Warning. H319: Causes serious eye irritation

**2.1.2 Directive 67/548/EEC & Directive 1999/45/EC** Xi; Irritant. R36

**2.2 Label elements**

**2.2.1 According to Regulation (EC) No. 1272/2008 & 453/2010 (CLP)**

Hazard Pictogram

| | |
|---|---|
| Signal word(s) | Warning |
| Hazard statement(s) | H319: Causes serious eye irritation |
| Precautionary statement(s) | P264. Wash hands thoroughly after handling.<br>P280 Wear eye protection.<br>P305 + P351 + P338. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.<br>P337+P313: If eye irritation persists: Get medical advice/attention. |

**2.2.2 According to Directive 67/548/EEC & Directive 1999/45/EC**

Hazard Symbol


Irritant

Risk Phrases R36. Irritating to eye

| | | |
|---|---|---|
| | Safety Phrases | S26. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice |
| **2.3** | **Other hazards** | Not known |
| **2.4** | **Additional Information** | Not known |

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

**3.1 Substance**

| Composition | %W/W | EC No. | CAS No |
|---|---|---|---|
| Citric acid | 99.5 to 100.5 | 201-069-1 | 77-92-9 |

## SECTION 4: FIRST AID MEASURES

| | | |
|---|---|---|
| **4.1** | **Description of first aid measures** | |
| | **Inhalation** | Move to fresh air. |
| | **Skin Contact** | Wash off immediately with plenty of water for at least 15 minutes. If irritation persists, call a physician. |
| | **Eye Contact** | Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. |
| | **Ingestion** | Do NOT induce vomiting. Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. Consult a physician. |
| **4.2** | **Most important symptoms and effects, both acute and delayed** | Serious eye damage/eye irritation: Eye Irrit. 2 |
| **4.3** | **Indication of immediate medical attention and special treatment needed** | Consult a physician. |

## SECTION 5: FIRE-FIGHTING MEASURES

| | | |
|---|---|---|
| **5.1** | **Extinguishing Media** | |
| | **5.1.1 Suitable Extinguishing Media** | Use alcohol-resistant foam, carbon dioxide, dry powder or water fog. |
| | **5.1.2. Unsuitable Extinguishing Media** | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| **5.2** | **Special hazards arising from the substance or mixture** | Oxides of carbon |
| **5.3** | **Advice for fire-fighters** | In the event of fire, wear self-contained breathing apparatus and wear suitable protective clothing.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations |
| **5.4** | **Additional information** | Explosion hazard from the generation of dust. |

## SECTION 6: ACCIDENTAL RELEASE MEASURES

| | | |
|---|---|---|
| **6.1** | **Personal precautions, protective equipment and emergency procedures** | Use personal protective equipment. |
| **6.2** | **Environmental precautions** | Do not flush substance into surface water or sewage system. |
| **6.3** | **Methods and material for containment and cleaning up** | Sweep up or vacuum up spillage and collect in suitable container for disposal. |
| **6.4** | **Reference to other sections** | Section 8 |
| **6.5** | **Additional Information** | Not known |

## SECTION 7: HANDLING AND STORAGE

| | | |
|---|---|---|
| **7.1** | **Precautions for safe handling** | Avoid contact with skin and eyes. Use only in well-ventilated areas. Do not breathe vapours/dust |

| | | |
|---|---|---|
| **7.2** | **Conditions for safe storage, including any incompatibilities** | Keep locked up or in an area accessible only to qualified staff |
| | **Storage** | Store in tightly closed original container in a dry, cool and well ventilated place. Keep in original container. |
| | **Incompatible materials** | Strong oxidising substances, strong alkalis. |

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters**

**8.1.1 Occupational Exposure Limits** No values assigned

**8.1.2 Biological limit values** No values assigned

**8.2 PNECs and DNELs**

**DNELs - Health** No true DNEL for systemic toxicity can be derived. Local effects, eye irritation should be considered.

**PNEC/PEC – Environment**

| Compartment | PNEC |
|---|---|
| Aquatic PNECaqua – freshwater (mg/l) | 0.44 |
| PNECaqua - marine water (mg/l) | 0.044 |
| PNECfreshwater-sediment (mg/kg d.w.) | 3.46. (Equivalent to 0.752 mg/kg wwt) |
| The PNECmarine-sediment mg/kg d.w. | 34.6. (Equivalent to 7.52 mg/kg wwt) |
| Terrestrial (PNECsoil mg/kg d.w.) | 33.1 |
| Sewage treatment plant PNEC STP (mg/l) | >1000 |
| Atmospheric Compartment | Not applicable |

**8.3 Exposure controls**

**8.3.1 Appropriate engineering controls** Minimise the risk of dust inhalation. Provide adequate ventilation.

**8.3.2 Personal protection equipment**

**Eye/face protection** Safety glasses with side-shields

**Skin protection (Hand protection/ Other)** Avoid contact with skin, eyes and clothing. Wash hands before breaks and at the end of workday. Protective gloves must satisfy the specifications of EU Directive 89/686/EEC and EN 374

**Respiratory protection** Provide adequate ventilation. Wear respirator where dust level exceeds 10 mg/m3.

**Thermal hazards** Not applicable

**8.3.3 Environmental Exposure Controls** Do not allow to enter drains, sewers or watercourses

**8.3.4 Hygiene measures** Do not smoke in the work area. Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**9.1 Information on basic physical and chemical properties**

| | |
|---|---|
| Appearance | Solid, crystalline |
| Colour | White |
| Odour | Odourless |
| pH (Value) | 1.7 (100g/l) |
| Melting Point | Approx.153 °C at 1,013 hPa |
| Boiling point/boiling range (°C): | Decomposes before boiling |

| | | |
|---|---|---|
| | Flash Point (°C) | Not known |
| | Flammability | Non flammable |
| | Density | 1.665 g/cm³ at 20°C |
| | Solubility (Water) | 590 g/L at 20°C |
| | Solubility (Other) | Soluble in alcohol |
| | Partition Coefficient (Log Kow: -n-Octanol/water) | -0.2 to -1.8 |
| | Decomposition Temperature (°C) | Not known |
| | Explosive properties | Not explosive |
| | Oxidising properties | Not oxidising |
| **9.2** | **Other information** | The fraction below 100 µm = 84.1%; the D50 of the fraction below 100 µm = at 31.99 µm. |
| | Granulometry | |
| | Dissociation constant | pKa: 3.13, 4.76 and 6.4 at 25°C |

## SECTION 10: STABILITY AND REACTIVITY

| | | |
|---|---|---|
| **10.1** | **Reactivity** | Reacts with alkaline materials |
| **10.2** | **Chemical stability** | Stable under normal conditions |
| **10.3** | **Conditions to avoid** | Exposure to heat and moisture. |
| **10.4** | **Incompatible materials** | Sodium nitrite, potassium nitrite |
| **10.5** | **Hazardous Decomposition Product(s)** | Oxides of carbon. |

## SECTION 11: TOXICOLOGICAL INFORMATION

| | | |
|---|---|---|
| **11.1** | **Information on toxicological effects** | |
| **11.1.1** | **Substances** | |
| | **Acute toxicity** | |
| | Ingestion LD50 (mouse) | 5400 mg/kg bw |
| | Inhalation | No data |
| | **Skin Contact. LD50 (dermal):** | >2000 mg/kg bw |
| | **Skin corrosion/irritation** | Mild skin irritant |
| | **Eye Contact** | Irritating |
| | **Respiratory or skin sensitization –skin** | Not a sensitizer |
| | **Mutagenicity** | Not a mutagen |
| | **Carcinogenicity** | Not a carcinogen |
| | **Reproductive toxicity** | Not a reproductive toxin |
| | **STOT - single exposure** | Not known |
| | **STOT - repeated exposure** | Not known |
| | **Aspiration hazard** | Not known |
| **11.2** | **Other information** | Not known |

## SECTION 12: ECOLOGICAL INFORMATION

| | | |
|---|---|---|
| **12.1** | **Toxicity** | |
| | Fish LC50 (48hr) | 440 mg/l |
| | D. Magna LC 50 (24hr) | 1535 mg/l |
| | Algae (8 d mat. (nominal) based on cell density | 425 mg/l |
| **12.2** | **Persistence and degradability** | Biodegradable |
| **12.3** | **Bioaccumulative potential** | No expected to bioaccumulate |
| **12.4** | **Mobility in soil** | Not applicable |
| **12.5** | **Results of PBT and vPvB assessment** | Not a PBT or a vPvB |
| **12.6** | **Other adverse effects** | Not known |

## SECTION 13: DISPOSAL CONSIDERATIONS

| | | |
|---|---|---|
| **13.1** | **Waste treatment methods** | Disposal to licensed waste disposal site in accordance with local Waste Disposal Authority. |
| **13.2** | **Additional Information** | Not known |

## SECTION 14: TRANSPORT INFORMATION

| | | |
|---|---|---|
| **14.1** | **Land transport (ADR/RID)** | Not subject to transport regulations. |
| **14.2** | **Sea transport (IMDG)** | Not subject to transport regulations. |
| **14.3** | **Air transport (ICAO/IATA)** | Not subject to transport regulations. |
| **14.4** | **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** | Not known |

## SECTION 15: REGULATORY INFORMATION

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

| | | |
|---|---|---|
| **15.1.1** | **EU regulations** | User to follow EU directives and regulations |
| | **Authorisations and/or restrictions on use** | Not applicable |
| **15.1.2** | **National regulations** | User to follow national regulations |

## SECTION 16: OTHER INFORMATION

**The following sections contain revisions or new statements:** Version 1.

**LEGEND**

| | |
|---|---|
| LTEL | Long Term Exposure Limit |
| STEL | Short Term Exposure Limit |
| STOT | Specific Target Organ Toxicity |
| DNEL | Derived No Effect Level |
| PNEC | Predicted No Effect Concentration |

**References:**

Chemical Safety Report for citric acid and citrates

Regulation (EC) No. 1272/2008 & 453/2010 (CLP)

Directive 67/548/EEC & Directive 1999/45/EC

**Risk Phrases and Safety Phrases**

R36: Irritating to eyes

S26: Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

**Hazard statement(s) and Precautionary statement(s)**

H319: Causes serious eye irritation

P264: Wash hands thoroughly after handling.

P280: Wear eye 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.

**Training advice:** Ensure staff and workers receive adequate training with regular updates in the handling of chemicals

**Additional Information.** Not known



### Annexes

### I. Exposure scenarios

### II. Use descriptors

**Annexes I. Exposure scenarios**

**Index**



| **1. Exposure Scenario** | |
|---|---|
| **Use of citric acid as an intermediate. Industrial** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures industrial sites |
| | 09. Manufacture of fine chemicals |
| **Chemical product category (PC):** | 19. Intermediate |
| **Process category (PROC):** | 01. Use in closed process, no likelihood of exposure |
| | 02. Use in closed, continuous process with occasional controlled exposure |
| | 04. Use in batch and other process (synthesis) where opportunity for exposure arises |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| **Article Categories [AC]:** | Not applicable |
| **Environmental release category (ERC):** | 06a. Industrial use resulting in manufacture of another substance (use of intermediates) |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. Minimise manual handling. |
| **Engineering control measures:** | Local exhaust ventilation. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Not applicable |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |

| | |
|---|---|
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated. Precautions against dust explosion and irritation caused by dust inhalation. |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable |
| **Method:** | Not known |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

| | |
|---|---|
| **2. Exposure Scenario** | |
| **Use of citric acid formulation into preparations/mixtures –industrial** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| | 10. Formulation [mixing] of preparations and/or re-packaging (excluding alloys) |
| | 05. Manufacture of textiles, leather, fur |
| | 13. Manufacture of other non-metallic mineral products, e.g. plasters, cement |
| | 20. Health services |
| **Chemical product category (PC):** | 0. Other |
| | 01 Adhesives, sealants |
| | 03. Air care products |
| | 09a. Coatings and paints, thinners, paint removers |
| | 09b. Fillers, putties, plasters, modelling clay |
| | 12. Fertilizers |
| | 18. Ink and toners |
| | 30. Photo-chemicals. |
| | 31. Polishes and wax blends |
| | 35. Washing and cleaning products (including solvent based products) |
| | 39. Cosmetics, personal care products |
| | |
| **Process category (PROC):** | 01. Use in closed process, no likelihood of exposure |
| | 02. Use in closed, continuous process with occasional controlled exposure |
| | 03. Use in closed batch process (synthesis or formulation) |
| | 04. Use in batch and other process (synthesis) where opportunity for exposure arises |
| | 05. Mixing or blending in batch processes for formulation of preparations/mixtures and articles (multistage and/or significant contact) |
| | 07. Industrial spraying |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large |

| | |
|---|---|
| | containers at dedicated facilities |
| | 09. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| | 13. Treatment of articles by dipping and pouring |
| | 14. Production of preparations/mixtures or articles by tabletting, compression, extrusion, pelletisation |
| | 15. Use as laboratory reagent |
| | 19. Hand-mixing with intimate contact and only PPE available |
| **Article Categories [AC]:** | Not applicable |
| **Environmental release category (ERC):** | 01. Manufacture of substances |
| | 02. Formulation of preparations/mixtures |
| | 03. Formulation in materials |
| | 04. Industrial use of processing aids in processes and products, not becoming part of articles |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. Minimise manual handling. |
| **Engineering control measures:** | Local exhaust ventilation. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Industrial professional - ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated. Precautions against dust explosion and irritation caused by dust inhalation. |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |

| | |
|---|---|
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

| **3. Exposure Scenario** | |
|---|---|
| **Use of citric acid in personal care products. Industrial, professional and consumer users.**<br><br>**Use is treated as exempt from REACH in respect of human health, formulation is also covered under Citric acid –formulation** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 20. Health services |
| | 21. Consumer uses: Private households (= general public = consumers) |
| | 22. Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| **Chemical product category (PC):** | 02. Adsorbents |
| | 03. Air care products |
| **Process category (PROC):** | 10. Roller application or brushing |
| | 11. Non industrial spraying |
| | 19. Hand-mixing with intimate contact and only PPE available |
| **Article Categories [AC]:** | 08. Paper articles |
| **Environmental release category (ERC):** | 08a. Wide dispersive indoor use of processing aids in open systems |
| | 11a. Wide dispersive indoor use of long-life articles and materials with low release |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust.<br>Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Industrial & professional - ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Good hygiene and housekeeping |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |

| | |
|---|---|
| **Workers:** | Long term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Long term exposure to low concentrations during application/use. |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

| **4. Exposure Scenario** | |
|---|---|
| **Use of citric acid in detergents and cleaning products. Industrial, professional and consumer users** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| | 21 Consumer uses: Private households (= general public = consumers) |
| | 22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| **Chemical product category (PC):** | 03. Air care products |
| | 28. Perfumes, fragrances |
| | 31. Polishes and wax blends |
| | 35. Washing and cleaning products (including solvent based products) |
| | 36. Water softeners |
| | 37. Water treatment chemicals |
| **Process category (PROC):** | 01. Use in closed process, no likelihood of exposure |
| | 02. Use in closed, continuous process with occasional controlled exposure |
| | 04 Use in batch and other process (synthesis) where opportunity for exposure arises |
| | 05. Mixing or blending in batch processes for formulation of preparations/mixtures/mixtures and articles (multistage and/or significant contact) |
| | 07. Industrial spraying |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| | 09. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| | 10. Roller application or brushing |
| | 11. Non industrial spraying |
| | 13. Treatment of articles by dipping and pouring |
| | 19. Hand-mixing with intimate contact and only PPE available |
| **Article Categories [AC]:** | 08. Paper articles |
| **Environmental release category (ERC):** | 02. Formulation of preparations/mixtures |
| | 04. Industrial use of processing aids in processes and products, not becoming part of articles |
| | 08a. Wide dispersive indoor use of processing aids in open systems |
| | 8d. Wide dispersive outdoor use of processing aids in open systems |
| | 09a. Wide dispersive indoor use of substances in closed systems |
| | 09b. Wide dispersive outdoor use of substances in closed systems |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust.<br>Implement basic standards of occupational hygiene |

| | |
|---|---|
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Industrial professional - ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Formulators information |
| **Service life of substances in articles:** | In use 2 to 12 months |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.<br>The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Good hygiene and housekeeping |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Short term during formulation. Long term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Long term exposure to low concentrations during application/use |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **5. Exposure Scenario** | |
| **Use of citric acid in paper industry. Industrial** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures industrial sites |
| | 06a. Manufacture of pulp, paper and paper products |
| **Chemical product category (PC):** | 26. Paper and board dye, finishing and impregnation products: including bleaches and other processing aids |
| **Process category (PROC):** | 05. Mixing or blending in batch processes for formulation of preparations/mixtures/mixtures and articles (multistage and/or significant contact) |
| | 8a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. |
| **Article Categories [AC]:** | Not applicable |

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| **Environmental release category (ERC):** | 04. Industrial use of processing aids in processes and products, not becoming part of articles |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated. |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Long term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **6. Exposure Scenario** | |
| **Use of citric acid in construction products. Industrial, professional and consumer** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 02. Mining, (without offshore industries) |
| | 03. Industrial uses: Uses of substances as such or in preparations/mixtures industrial sites |
| | 10. Formulation [mixing] of preparations and/or re-packaging (excluding alloys) |
| | 19. Building and construction work |
| | 21. Consumer uses: Private households (= general public = consumers) |
| | 22 .Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| **Chemical product category (PC):** | 0. Other |

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| **Process category (PROC):** | 02. Use in closed, continuous process with occasional controlled exposure |
| | 04. Use in batch and other process (synthesis) where opportunity for exposure arises |
| | 05. Mixing or blending in batch processes for formulation of preparations/mixtures and articles (multistage and/or significant contact) |
| | 07. Industrial spraying |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| | 10. Roller application or brushing |
| | 11. Non industrial spraying |
| | 13. Treatment of articles by dipping and pouring |
| | 14. Production of preparations/mixtures or articles by tabletting, compression, extrusion, pelletisation |
| | 19. Hand-mixing with intimate contact and only PPE available |
| | 21. Low energy manipulation of substances bound in materials and/or articles |
| | 24. High (mechanical) energy work-up of substances bound in materials and/or articles |
| **Article Categories [AC]:** | 04. Stone, plaster, cement, glass and ceramic articles |
| **Environmental release category (ERC):** | 05. Industrial use resulting in inclusion into or onto a matrix |
| | 08c. Wide dispersive indoor use resulting in inclusion into or onto a matrix |
| | 08f. Wide dispersive outdoor use resulting in inclusion into or onto a matrix |
| | 10a. Wide dispersive outdoor use of long-life articles and materials with low release |
| | 10b. Wide dispersive outdoor use of long-life articles and materials with high or in-tended release (including abrasive processing) |
| | 11a. Wide dispersive indoor use of long-life articles and materials with low release |
| | 11b. Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing) |
| | 12a. Industrial processing of articles with abrasive techniques (low release) |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Industrial/professional, ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and |

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| | sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Good hygiene and housekeeping |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Long term exposure during application. |
| **Consumers:** | Long term exposure to low concentrations during application/use. |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **7. Exposure Scenario** | |
| **Use of citric acid Polymers and plastics. Industrial** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| **Chemical product category (PC):** | 32. Polymer preparations and compounds |
| **Process category (PROC):** | 03. Use in closed batch process (synthesis or formulation) |
| | 05. Mixing or blending in batch processes for formulation of preparations/mixtures and articles (multistage and/or significant contact) |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| **Article Categories [AC]:** | Not applicable |
| **Environmental release category (ERC):** | 06b. Industrial use of reactive processing aids |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. Minimise manual handling. |
| **Engineering control measures:** | Local exhaust ventilation. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Industrial professional - ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |

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| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated. Precautions against dust explosion and irritation caused by dust inhalation. |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Long term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **8. Exposure Scenario** | |
| **Use of citric acid in oil industry. Industrial.** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 02. Offshore industries |
| | 03. Industrial uses: Uses of substances as such or in preparations/mixtures industrial sites |
| **Chemical product category (PC):** | 20. Products such as ph-regulators, flocculants, precipitants, neutralization agents |
| | 40. Other |
| **Process category (PROC):** | 03. Use in closed batch process (synthesis or formulation) |
| | 04. Use in batch and other process (synthesis) where opportunity for exposure arises |
| | 05. Mixing or blending in batch processes for formulation of preparations/mixtures and articles (multistage and/or significant contact) |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| **Article Categories [AC]:** | Not applicable |
| **Environmental release category (ERC):** | 8d. Wide dispersive outdoor use of processing aids in open systems |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust.<br>Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |

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| **Eye protection:** | Wear safety goggles or face shield. Industrial/professional, ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and management/supervision are in place |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Long term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **9. Exposure Scenario** | |
| **Use of citric acid in paints and coatings. Industrial, professional and consumer users** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| | 17. General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment |
| | 18. Manufacture of furniture |
| | 19. Building and construction work |
| | 21. Consumer uses: Private households (= general public = consumers) |
| | 22. Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| **Chemical product category (PC):** | 09a. Coatings and paints, thinners, paint removers |
| | 9b. Fillers, putties, plasters, modelling clay |
| | 18. Ink and toners |
| | 34. Textile dyes, finishing and impregnating products; including bleaches and other processing aids |
| **Process category (PROC):** | 07. Industrial spraying |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at nondedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| | 10. Roller application or brushing |
| | 11. Non industrial spraying |

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| | 19. Hand-mixing with intimate contact and only PPE available |
| | 24. High (mechanical) energy work-up of substances bound in materials and/or articles |
| **Article Categories [AC]:** | 04. Stone, plaster, cement, glass and ceramic articles |
| | 11. Wood articles |
| **Environmental release category (ERC):** | 05. Industrial use resulting in inclusion into or onto a matrix |
| | 08c. Wide dispersive indoor use resulting in inclusion into or onto a matrix |
| | 08f. Wide dispersive outdoor use resulting in inclusion into or onto a matrix |
| | 10a. Wide dispersive outdoor use of long-life articles and materials with low release |
| | 10b. Wide dispersive outdoor use of long-life articles and materials with high or in-tended release (including abrasive processing) |
| | 11a. Wide dispersive indoor use of long-life articles and materials with low release |
| | 11b. Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing) |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Industrial professional - ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Formulators information |
| **Service life of substances in articles:** | |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Good hygiene and housekeeping |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Short term during formulation. Long term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Exposure to low concentrations during application/use |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the |

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| **10. Exposure Scenario** | |
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| **Use of citric acid in photography products. Professional and consumer users** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| | 20. Health services |
| | 21. Consumer uses: Private households (= general public = consumers) |
| | 22. Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| **Chemical product category (PC):** | 30. Photo-chemicals |
| **Process category (PROC):** | 05. Mixing or blending in batch processes for formulation of preparations/mixtures and articles (multistage and/or significant contact) |
| | 13. Treatment of articles by dipping and pouring |
| **Article Categories [AC]:** | Not applicable |
| **Environmental release category (ERC):** | 08a Wide dispersive indoor use of processing aids in open systems |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Professional - ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Formulators information |
| **Service life of substances in articles:** | |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Good hygiene and housekeeping |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Short term during formulation. Long term exposure during application |
| **Consumers:** | Exposure to low concentrations during application/use |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |

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| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **11. Exposure Scenario** | |
| **Use of citric acid in textiles. Industrial** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures industrial sites |
| | 05. Manufacture of textiles, leather, fur |
| **Chemical product category (PC):** | 20. Products such as ph-regulators, flocculants, precipitants, neutralization agents |
| | 23. Leather tanning, dye, finishing, impregnation and care products |
| | 24. Lubricants, greases, release products |
| **Process category (PROC):** | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| | 10. Roller application or brushing |
| | 13. Treatment of articles by dipping and pouring |
| | 22. Potentially closed processing operations with minerals/metals at elevated temperature |
| **Article Categories [AC]:** | 05. Fabrics, textiles and apparel |
| | 06. Leather articles |
| **Environmental release category (ERC):** | 04. Industrial use of processing aids in processes and products, not becoming part of articles |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area, good personal hygiene, staff training and Management/ supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to |

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| | bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Long term exposure during application.<br>Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable<br>. |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the Esds |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **12. Exposure Scenario** | |
| **Use of citric acid in laboratory agents. Industrial users** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| **Chemical product category (PC):** | 04. Anti-Freeze and de-icing products |
| | 16. Heat transfer fluids |
| | 20. Products such as ph-regulators, flocculants, precipitants, neutralization agents |
| | 37. Water treatment chemicals |
| **Process category (PROC):** | 01. Use in closed process, no likelihood of exposure |
| | 02. Use in closed, continuous process with occasional controlled exposure |
| | 03. Use in closed batch process (synthesis or formulation) |
| | 04. Use in batch and other process (synthesis) where opportunity for exposure arises |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| **Article Categories [AC]:** | Not applicable |
| **Environmental release category (ERC):** | 04. Industrial use of processing aids in processes and products, not becoming part of articles |
| | 07. Industrial use of sub-stances in closed systems |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. |
| **Engineering control measures:** | Keep area well ventilated. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area; good personal hygiene, staff training and management/supervision are in place. |

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| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Formulators information |
| **Service life of substances in articles:** | |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Short term during formulation. Long term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **13. Exposure Scenario** | |
| **Use of citric acid in water treatment. Industrial** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| | 14. Manufacture of basic metals, including alloys |
| | 15. Manufacture of fabricated metal products, except machinery and equipment |
| | 16. Manufacture of computer, electronic and optical products, electrical equipment |
| | 17. General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment |
| **Chemical product category (PC):** | 04. Anti-Freeze and de-icing products |
| | 07. Base metals and alloys |
| | 14. Metal surface treatment products, including galvanic and electroplating products |
| | 16. Heat transfer fluids |
| | 17. Hydraulic fluids |
| | 20. Products such as ph-regulators, flocculants, precipitants, neutralization agents |
| | 25. Metal working fluids |
| | 26. Paper and board dye, finishing and impregnation products: including bleaches and other processing aids |

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| | 35. Washing and cleaning products (including solvent based products) |
| | 37. Water treatment chemicals |
| **Process category (PROC):** | 01. Use in closed process, no likelihood of exposure |
| | 02. Use in closed, continuous process with occasional controlled exposure |
| | 03. Use in closed batch process (synthesis or formulation) |
| | 04. Use in batch and other process (synthesis) where opportunity for exposure arises |
| | 07. Industrial spraying |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| | 09. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| | 10. Roller application or brushing |
| | 13. Treatment of articles by dipping and pouring |
| | 18. Greasing at high energy conditions |
| | 20. Heat and pressure transfer fluids in dispersive, professional use but closed systems |
| | 25. Other hot work operations with metals |
| **Article Categories [AC]:** | Not applicable |
| **Environmental release category (ERC):** | 04. Industrial use of processing aids in processes and products, not becoming part of articles |
| | 07. Industrial use of sub-stances in closed systems |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. Minimise manual handling. |
| **Engineering control measures:** | Local exhaust ventilation. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area; good personal hygiene, staff training and management/ supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated. Precautions against dust explosion and irritation caused by dust inhalation. |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and run off and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |

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| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

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| **14. Exposure Scenario** | |
| **1. Use of citric acid in treatment of metals & surfaces. Industrial** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| | 14. Manufacture of basic metals, including alloys |
| | 15. Manufacture of fabricated metal products, except machinery and equipment |
| | 16. Manufacture of computer, electronic and optical products, electrical equipment |
| | 17. General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment |
| **Chemical product category (PC):** | 07. Base metals and alloys |
| | 14. Metal surface treatment products, including galvanic and electroplating products |
| | 25. Metal working fluids |
| | 31. Polishes and wax blends |
| | 35. Washing and cleaning products (including solvent based products) |
| **Process category (PROC):** | 02. Use in closed, continuous process with occasional controlled exposure |
| | 03. Use in closed batch process (synthesis or formulation) |
| | 04. Use in batch and other process (synthesis) where opportunity for exposure arises |
| | 07. Industrial spraying |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| | 09. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| | 10. Roller application or brushing |
| | 13. Treatment of articles by dipping and pouring |
| | 17. Lubrication at high energy conditions and in partly open process |
| | 18. Greasing at high energy conditions |
| | 23. Open processing and transfer operations with minerals/metals at elevated temperature |
| **Article Categories [AC]:** | Not applicable |
| **Environmental release category (ERC):** | 04. Industrial use of processing aids in processes and products, not becoming part of articles |

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| | 06b. Industrial use of reactive processing aids |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene. |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. Minimise manual handling. |
| **Engineering control measures:** | Local exhaust ventilation. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area; good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated. Precautions against dust explosion and irritation caused by dust inhalation. |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Not applicable |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Short term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Not applicable |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

| **15. Exposure Scenario** | |
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| **1. Use of citric acid agricultural applications. Industrial, professional & consumer** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 01. Agriculture, forestry, fishery |

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| | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| | 21. Consumer uses: Private households (= general public = consumers) |
| | 22. Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| **Chemical product category (PC):** | 08. Biocidal products (e.g. Disinfectants, pest control) |
| | 12. Fertilizers |
| | 21. Laboratory chemicals |
| **Process category (PROC):** | 03. Use in closed batch process (synthesis or formulation) |
| | 05. Mixing or blending in batch processes for formulation of preparations/mixtures and articles (multistage and/or significant contact) |
| | 08a. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | 08b. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| | 10. Roller application or brushing |
| | 11. Non industrial spraying |
| | 14. Production of preparations/mixtures or articles by tabletting, compression, extrusion, pelletisation |
| | 15. Use as laboratory reagent |
| | 19. Hand-mixing with intimate contact and only PPE available |
| **Article Categories [AC]:** | 02. Formulation of preparations/mixtures |
| **Environmental release category (ERC):** | 04. Industrial use of processing aids in processes and products, not becoming part of articles |
| | 8b. Wide dispersive indoor use of reactive substances in open systems |
| | 8d. Wide dispersive outdoor use of processing aids in open systems |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. Minimise manual handling. |
| **Engineering control measures:** | Local exhaust ventilation. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Industrial professional - ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area; good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |
| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated. Precautions against dust explosion and irritation caused by dust inhalation. |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Good hygiene and housekeeping |

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| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Short term exposure during application. Use of PPE will to minimise handling and contact. |
| **Consumers:** | Short term exposure during application. |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals. They must also ensure the substance is in compliance with directives and regulations concerned with the placing on the marketing of pesticidal products |

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| **16. Exposure Scenario** | |
| **1. Use of citric acid in medical devices. Industrial & consumer** | |
| **2. Processes and activities covered by the exposure scenario** | |
| **Sector of end use (SU):** | 03. Industrial uses: Uses of substances as such or in preparations/mixtures at industrial sites |
| | 20. Health services |
| | 22. Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| **Chemical product category (PC):** | 20 Products such as ph-regulators, flocculants, precipitants, neutralization agents |
| **Process category (PROC):** | 01. Use in closed process, no likelihood of exposure |
| **Article Categories [AC]:** | 07. Industrial use of sub-stances in closed systems |
| **Environmental release category (ERC):** | 8d. Wide dispersive outdoor use of processing aids in open systems |
| **3. Operational conditions of use** | |
| **Control parameters**: | Precautionary measures against electrostatic discharge to be taken. LEV and respiratory protection to be taken in areas where workers may come into contact with dust. Implement basic standards of occupational hygiene. |
| **Duration and frequency of use:** | Users to specify |
| **Maximum amount per time or activity:** | Users to specify |
| **Other operational conditions of use:** | Avoid splashes and spills. Minimise manual handling. |
| **Engineering control measures:** | Local exhaust ventilation. Exposure limit values: Not known |
| **Other protective equipment:** | Good hygiene and housekeeping |
| **Respiratory protection:** | Required where ventilation is insufficient or exposure is prolonged |
| **Hand protection:** | Rubber or PVC gloves |
| **Eye protection:** | Wear safety goggles or face shield. Industrial professional - ensure eyewash and showers are in the proximity to workstation location. |
| **Other information:** | Avoid contact with the substance or contaminated objects, Ensure regular cleaning of equipment and work area; good personal hygiene, staff training and management/supervision are in place. |
| **4. Physical form of substance / preparation / mixture or article** | |
| **Information on basic physical and chemical properties:** | Solid, crystalline, acidic as a liquid |
| **5. Product specification** | |
| **Physical form of the product:** | Part of a preparation can be a liquid or solid. |

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| **Concentration of substance in preparation / mixture or article:** | Users to specify |
| **Service life of substances in articles:** | Users to specify |
| **6. Risk Management Measures** | |
| **Occupational exposure controls:** | Keep area well ventilated. Precautions against dust explosion and irritation caused by dust inhalation. |
| **Environmental Exposure Controls:** | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. The substance is biodegradable, has a low Kow and is not expected to bioaccumulate. |
| **7. Consumer use:** | Good hygiene and housekeeping |
| **8. Waste management measures** | |
| **Description and information on safe handling of surplus or waste:** | Neutralise before treatment in a sewage treatment plant. Disposal untreated waste should be in accordance with local, state or national legislation. |
| **9. Exposure assessment** | |
| **Human exposure prediction:** | |
| **Workers:** | Use of PPE will to minimise handling and contact. |
| **Consumers:** | Good hygiene and housekeeping |
| **Method:** | Not applicable |
| **Exposure estimation:** | Not known |
| **Secondary Poisoning:** | Not expected |
| **Indirect exposure to humans via the environment:** | Not expected |
| **10. Other information** | |
| **Control parameters**: | Refer to the eSDS |
| **Method to check compliance:** | Management/supervision to check that the RMMs in place are being used correctly and OCs followed. Ensure staff and workers receive adequate training with regular updates in the handling of chemicals |

## Annex II Use descriptors

| Identified use | Sector of Use - main user groups (SU) | Sector of Use – sectors of end-use | Preparation Category (PC) | Process category (PROC) | Article category (AC) | Environmental Release Category (ERC) |
|---|---|---|---|---|---|---|
| Manufacture | SU3 | SU3 | PC19 | PROC1, 2, 3, 8b | | ERC1 |
| Intermediate | SU3 | SU3, 9 | PC19 | PROC1, 2, 3, 4, 8b | | ERC6a |
| Formulation | SU3, 10 | SU5, 13, 20 | PC0, 1, 3, 9, 12, 18, 30, 31, 35, 39 | PROC 2, 3, 4, 5, 7, 8a, 8b, 9, 13, 14, 15, 19 | | ERC1, 2, 3, 4 |
| Personal care products | SU21, 22 | SU20 | PC2, 39 | PROC 10, 11, 19 | AC8 | ERC 8a, 11a |
| Detergent and cleaning products | SU3, 21, 22 | | PC3, 28, 31, 35, 36, 37 | PROC1, 2, 4, 5, 7, 8a, 8b, 9, 10, 11, 13, 19 | AC8 AC35 | ERC2, 4, 8A, 8D, 9A, 9B |
| Paper industry | SU3 | SU6 | PC26 | PROC 5, 8a | | ERC4 |
| Construction products | SU3, 21, 22 | SU2, 10, 19 | PC10 | PROC 2, 4, 5, 7, 8a, 8b, 10, 11. 13, 14, 19, 21, 24 | AC4, 12-1, 12-2 | ERC5, 8c, 8f, 10a, 10b, 11a, 11b, 12a |
| Polymers and plastics | SU3 | SU11, 12 | PC32 | PROC 3, 5, 8a, 8b | | RC6b |
| Oil industry | SU3 | SU2 | PC20, 40 | PROC 3, 4, 5, 8a, 8b, | | ERC8d |
| Paints and coatings | SU3, 21, 22 | SU17, 18, 19 | PC9, 18, 34 | PROC 7, 8a, 8b, 10, 11, 19, 21, 24 | AC4, 11 | ERC5, 8c, 8f, 10a, 10b, 11a, 11b |
| Photography products | SU3, 21, 22 | SU20 | PC30 | PROC 5, 13 | | ERC8a |
| Textile industry | SU3 | SU5 | PC20, 23, 24 | PROC 8a, 8b, 10, 13, 22 | AC5, 6 | ERC4 |
| Laboratory reagents | SU3 | | PC4, 16, 20, 37 | PROC 1, 2, 3, 4, 8a, | | ERC4, 7 |
| Water treatment | SU3 | SU14, 15, 16, 17 | PC4, 7, 14, 16, 17, 20, 25, 31, 35, 37 | PROC 1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 18, 20, 25, xyz1 | | ERC4, 7 |
| Treatment of metal surfaces SU3 | SU3 | SU14, 15, 16, 17 | PC7, 14, 25, 31, 35 | PROC 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17, 18, 23 | | ERC4, 6b |
| Agricultural applications | SU3, 21, 22 | SU1 | PC8, 12, 21 | PROC 3, 5, 8a, 8b, 10, 11, 14, 15, 19 | | ERC2, 4, 8b, 8d |
| Medical devices | SU3 | SU22 SU20 | PC20 | PROC1 | | ERC7 |