

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

## CITRIC ACID ANHYDROUS

Version 4.1

Print Date 2013/07/17

Revision date / valid from 2013/07/17

MSDS code: MCIT100

### Section 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Trade name : CITRIC ACID ANHYDROUS  
 Substance name : Citric acid  
 CAS-No. : 77-92-9  
 EC-No. : 201-069-1  
 Registration number : 01-2119457026-42-xxxx

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

Use of the Substance/Mixture : Used as:, Identified use: See table in front of appendix for a complete overview of identified uses.  
 Use of the Substance/Mixture : Used as:, Food additive, Identified use: See table in front of appendix for a complete overview of identified uses.  
 Uses advised against : At this moment we have not identified any uses advised against

#### 1.3. Details of the supplier of the safety data sheet

Company : Brenntag UK & Ireland  
 Albion House, Rawdon Park  
 GB LS19 7XX Leeds Yeadon  
 Telephone : +44 (0) 113 3879 200  
 Telefax : +44 (0) 113 3879 280  
 E-mail address : msds@brenntag.co.uk

#### 1.4. Emergency telephone number

Emergency telephone number : Emergency only telephone number (open 24 hours):  
 +44 (0) 1865 407333 (N.C.E.C. Culham)

### Section 2: Hazards identification

#### 2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	Hazard category	Target Organs	Hazard statements
Serious eye damage/eye irritation	Category 2	---	H319

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

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

Directive 67/548/EEC or 1999/45/EC	
Hazard symbol / Category of danger	Risk phrases
Irritant (Xi)	R36


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

### Most important adverse effects

Human Health	:	Causes serious eye irritation.
Physical and chemical hazards	:	Stable under normal conditions., Risk of dust explosion.
Potential environmental effects	:	According to available data, this product is not harmful to the environment.

## 2.2. Label elements

### Labelling according to Regulation (EC) No 1272/2008

Hazard symbols	:	
Signal word	:	Warning
Hazard statements	:	H319 Causes serious eye irritation.
Precautionary statements	:	
Prevention	:	P264 Wash hands thoroughly after handling. P280 Wear protective gloves/ eye protection/ face protection.
Response	:	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.

### Hazardous components which must be listed on the label:

- Citric acid

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### 2.3. Other hazards

For Results of PBT and vPvB assessment see section 12.5.

## Section 3: Composition/information on ingredients

### 3.1. Substances

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)		Classification (67/548/EEC)
		Hazard class / Hazard category	Hazard statements	
<b>Citric acid</b>				
CAS-No. : 77-92-9		Eye Irrit.2	H319	Irritant; Xi; R36
EC-No. : 201-069-1	<= 100			
Registration : 01-2119457026-42-xxxx				

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

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

## Section 4: First aid measures

### 4.1. Description of first aid measures

- If inhaled : Remove to fresh air.
- In case of skin contact : Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician.
- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 5 minutes. If symptoms persist, call a physician.
- If swallowed : Clean mouth with water and drink afterwards plenty of water. If symptoms persist, call a physician.

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

- Symptoms : See Section 11 for more detailed information on health effects and symptoms.
- Effects : See Section 11 for more detailed information on health effects and symptoms.

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

- Treatment : Treat symptomatically.  
No further information available.

## Section 5: Firefighting measures

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### 5.1. Extinguishing media

- Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- Unsuitable extinguishing media : None known.

### 5.2. Special hazards arising from the substance or mixture

- Specific hazards during firefighting : In case of fire hazardous decomposition products may be produced such as: Carbon monoxide, Carbon dioxide (CO<sub>2</sub>)

### 5.3. Advice for firefighters

- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
- Further information : Dust may form explosive mixture in air.

## Section 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

- Personal precautions : Use personal protective equipment. Keep people away from and upwind of spill/leak. Avoid dust formation. For personal protection see section 8.

### 6.2. Environmental precautions

- Environmental precautions : Do not flush into surface water or sanitary sewer system.

### 6.3. Methods and materials for containment and cleaning up

- Methods and materials for containment and cleaning up : Use mechanical handling equipment. Keep in suitable, closed containers for disposal. Rinse with water.

### 6.4. Reference to other sections

- For personal protection see section 8.

## Section 7: Handling and storage

### 7.1. Precautions for safe handling

- Advice on safe handling : Handle in accordance with good industrial hygiene and safety practice. Avoid contact with the skin and the eyes. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity. Keep tightly closed in a dry and cool place. Avoid dust formation. Provide for appropriate exhaust ventilation and dust collection at machinery.
- Hygiene measures : Take off all contaminated clothing immediately. Wash hands before breaks and at the end of workday. Avoid contact with the

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skin and the eyes. Do not breathe dust or spray mist.

### 7.2. Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : Keep only in the original container.
- Advice on protection against fire and explosion : Avoid dust formation. Take precautionary measures against static discharges.
- Dust explosion class : St1
- Further information on storage conditions : Keep container tightly closed. Keep in a dry place. Avoid moisture. Protect against water.
- Advice on common storage : Incompatible with oxidizing agents. alkalis
- German storage class : 11 Combustible Solids

### 7.3. Specific end use(s)

- || Specific use(s) : Identified use: See table in front of appendix for a complete overview of identified uses.

## Section 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Other Occupational Exposure Limit Values

- (Additional) Information : Contains no substances with occupational exposure limit values.  
Contains no substances with occupational exposure limit values.

Component:	Citric acid	CAS-No.
		77-92-9

#### Predicted No Effect Concentration (PNEC)

Fresh water	: 0.44 mg/l
Marine water	: 0.044 mg/l
Fresh water sediment	: 3.46 mg/kg wwt
Marine sediment	: 34.6 mg/kg wwt
Sewage treatment plant (STP)	: > 1000 mg/l
Soil	: 33.1 mg/kg wwt

### 8.2. Exposure controls

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### Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.

### Personal protective equipment

#### *Respiratory protection*

Advice : In case of insufficient ventilation, wear suitable respiratory equipment.  
Recommended Filter type:P

#### *Hand protection*

Advice : Wear suitable 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.  
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.  
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

#### *Eye protection*

Advice : Tightly fitting safety goggles

#### *Skin and body protection*

Advice : Wear suitable protective clothing.

### Environmental exposure controls

General advice : Do not flush into surface water or sanitary sewer system.

## Section 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Form	:	crystalline
Colour	:	white
Odour	:	odourless
Odour Threshold	:	no data available
pH	:	1.8 (50 g/l; 25 °C)
Melting point/range	:	153 °C
Boiling point	:	no data available

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Flash point	:	345 °C (closed cup)
Evaporation rate	:	not applicable
Flammability (solid, gas)	:	not auto-flammable
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	not applicable
Relative vapour density	:	not applicable
Density	:	1.665 g/cm <sup>3</sup> (20 °C)
Water solubility	:	ca. 610 g/l (25 °C)
Solubility in other solvents	:	(Ethanol) soluble  (Chloroform) insoluble
Partition coefficient: n-octanol/water	:	log Kow -1.72 (20 °C)
Auto-ignition temperature	:	no data available
Thermal decomposition	:	> 170 °C
Viscosity, kinematic	:	not applicable
Explosive properties	:	EU legislation: Dust may form explosive mixture in air.
Oxidizing properties	:	not oxidising

### 9.2. Other information

No further information available.

## Section 10: Stability and reactivity

### 10.1. Reactivity

Advice : No decomposition if stored and applied as directed.

### 10.2. Chemical stability

Advice : Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

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Hazardous reactions : Incompatible with oxidizing agents. Dust may form explosive mixture in air.

### 10.4. Conditions to avoid

Conditions to avoid : Heat.  
Thermal decomposition : >170 °C

### 10.5. Incompatible materials

Materials to avoid : Strong acids and strong bases, Strong oxidizing agents

### 10.6. Hazardous decomposition products

Hazardous decomposition products : Carbon oxides

## Section 11: Toxicological information

### 11.1. Information on toxicological effects

#### Acute toxicity

##### Oral

Please find this information in the listing of the component/components below in the MSDS.

##### Dermal

Please find this information in the listing of the component/components below in the MSDS.

#### Irritation

##### Skin

Result : May cause skin irritation in susceptible persons.

##### Eyes

Result : Irritating to eyes.

#### Sensitisation

Result : Please find this information in the listing of the component/components below in the MSDS.

#### CMR effects

#### CMR Properties



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Carcinogenicity : Please find this information in the listing of the component/components below in the MSDS.

Mutagenicity : Please find this information in the listing of the component/components below in the MSDS.

Reproductive toxicity : Please find this information in the listing of the component/components below in the MSDS.

### Specific Target Organ Toxicity

#### Single exposure

remark : The substance or mixture is not classified as specific target organ toxicant, single exposure.

#### Repeated exposure

remark : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

### Other toxic properties

#### Aspiration hazard

No aspiration toxicity classification

Component:	Citric acid	CAS-No.
		77-92-9

### Acute toxicity

#### Oral

LD50 : 5000 mg/kg (mouse)

#### Dermal

LD50 : > 2000 mg/kg )

### Sensitisation

Result : not sensitizing

### CMR effects

#### CMR Properties

Carcinogenicity : It is not considered carcinogenic.

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Mutagenicity : It is not considered mutagenic.

Reproductive toxicity : It is not considered toxic for reproduction.

### Section 12: Ecological information

#### 12.1. Toxicity

Component:	Citric acid	CAS-No. 77-92-9
<b>Acute toxicity</b>		
<b>Fish</b>		
LC50	:	440 mg/l (Fish; 48 h)
<b>Toxicity to daphnia and other aquatic invertebrates</b>		
LC50	:	1535 mg/l (Daphnia magna (Water flea); 24 h)

#### 12.2. Persistence and degradability

Component:	Citric acid	CAS-No. 77-92-9
<b>Persistence and degradability</b>		
<b>Persistence</b>		
Result	:	no data available
<b>Biodegradability</b>		
Result	:	biodegradable

#### 12.3. Bioaccumulative potential

Component:	Citric acid	CAS-No. 77-92-9
<b>Bioaccumulation</b>		
Result	:	Bioaccumulation is not expected.

#### 12.4. Mobility in soil

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<b>Component:</b>	<b>Citric acid</b>	<b>CAS-No.</b>
		<b>77-92-9</b>

### Mobility

: no data available

### 12.5. Results of PBT and vPvB assessment

<b>Component:</b>	<b>Citric acid</b>	<b>CAS-No.</b>
		<b>77-92-9</b>

### Results of PBT and vPvB assessment

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

### 12.6. Other adverse effects

### Additional ecological information

Result : Do not flush into surface water or sanitary sewer system.

## Section 13: Disposal considerations

### 13.1. Waste treatment methods

Product : Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Dispose of as special waste in compliance with local and national regulations.

Contaminated packaging : In accordance with local and national regulations. Dispose of as unused product.

European Waste Catalogue Number : No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

## Section 14: Transport information

Not dangerous goods for ADR, RID and IMDG.

### 14.1. UN number

Not applicable.

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### 14.2. UN proper shipping name

Not applicable.

### 14.3. Transport hazard class(es)

Not applicable.

### 14.4. Packaging group

Not applicable.

### 14.5. Environmental hazards

Not applicable.

### 14.6. Special precautions for user

Not applicable.

### 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG : Not applicable.

## Section 15: Regulatory information

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

#### Citric acid

EU. Regulation No 1451/2007 [Biocides], Annex I, Active substances identified as existing (OJ (L 325)  
Listed EC Number: 201-069-1

:

#### Notification status

##### Citric acid:

Regulatory List	Notification	Notification number
AICS	YES	
DSL	YES	
EINECS	YES	201-069-1
ENCS (JP)	YES	(2)-1318
ISHL (JP)	YES	(2)-1318
JEX (JP)	YES	(2)-1318
KECI (KR)	YES	KE-20831
NZIOC	YES	HSR003138
PHARM (JP)	YES	
PICCS (PH)	YES	
TSCA	YES	

### 15.2. Chemical Safety Assessment

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|| A Chemical Safety Assessment has been carried out for this substance.

**Section 16: Other information****Full text of R-phrases referred to under sections 2 and 3.**

R36 Irritating to eyes.

**Full text of H-Statements referred to under sections 2 and 3.**

H319 Causes serious eye irritation.

**Further information**

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

|| Indicates updated section.

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No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Use as an intermediate	3	9	19	1, 2, 4, 8b	6a	NA	ES1617
2	Formulation & (re)packing of substances and mixtures	3	5, 10, 13, 20	1, 3, 9a, 9b, 12, 18, 30, 31, 35, 39	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 13, 14, 15, 19	1, 2, 3, 4	NA	ES1638
3	Use in polymers and plastic	3	NA	32	3, 5, 8a, 8b	6b	NA	ES2140
4	Uses in coatings	3	17, 18, 19	9a, 9b, 18, 34	7, 8a, 8b, 10, 19, 24	5	4, 11	ES2145
5	Uses in coatings	21	NA	9a, 9b, 18, 34	NA	8c, 8f, 10a, 10b, 11a, 11b	4, 11	ES2149
6	Uses in coatings	22	17, 18, 19	9a, 9b, 18, 34	8a, 8b, 10, 11, 19, 24	8c, 8f, 10a, 10b, 11a, 11b	4, 11	ES2147
7	Use in Cleaning Agents	3	NA	3, 28, 31, 35, 36, 37	2, 4, 7, 8a, 8b, 9, 10, 13	2, 4	8	ES2064
8	Use in Cleaning Agents	21	NA	3, 28, 31, 35, 36, 37	NA	8a, 8d, 9a, 9b	NA	ES2097
9	Use in Cleaning Agents	22	NA	3, 28, 31, 35, 36, 37	1, 4, 8a, 9, 10, 11, 13, 19	8a, 8d, 9a, 9b	NA	ES2068
10	Use in agrochemicals	3	1	8, 12, 21	3, 5, 8a, 8b, 10, 14, 15, 19	4	2	ES2238
11	Use in agrochemicals	21	1	8, 12, 21	NA	8b, 8d	NA	ES2252
12	Use in agrochemicals	22	1	8, 12, 21	3, 5, 8a, 8b, 10, 11, 14, 15, 19	8b, 8d	NA	ES2249
13	Use in laboratories	3	NA	NA	1, 2, 4, 8a	4, 7	NA	ES2190
14	Use in building and construction work	3	2, 10, 19	NA	4, 5, 7, 8a, 8b, 10, 13, 14, 19, 21, 24	5, 12a	4	ES2113
15	Use in building and construction work	21	2, 10, 19	0, 1, 9b	NA	8c, 8f, 10a, 10b, 11a, 11b	4	ES2138
16	Use in building and construction work	22	2, 10, 19	NA	4, 5, 8a, 8b, 10, 11, 13, 14, 19, 21, 24	8c, 8f, 10a, 10b, 11a, 11b	4	ES2136
17	Use in process water treatment	3	14, 15, 16, 17	4, 7, 14, 16, 17, 20, 25, 35, 37	1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 18, 20	4, 7	NA	ES2205
18	Use in oil industry	3	2a, 2b	20, 40	3, 4, 5	4	NA	ES2143
19	Use in metal surface treatment.	3	14, 15, 16, 17	7, 14, 25, 31, 35	2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17, 18, 23	4, 6b	NA	ES2219

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20	Use in cosmetics	21	20	2, 39	NA	8a, 11a	8	ES2033
21	Use in cosmetics	22	20	2, 39	10, 11, 19	8a, 11a	8	ES2062
22	Use in medical devices	3	20	20	1	7	7	ES11325
23	Use in medical devices	21	20	20	NA	8d	NA	ES11329
24	Use in medical devices	22	20	20	1	8d	NA	ES11327
25	Use in textile industry	3	5	20, 23, 24	8a, 8b, 10, 13, 22	4	NA	ES2182
26	Use in paper industry	3	6b	26	5, 8a	4	NA	ES2099
27	Use in photography products	3	20	30	5, 13	4	NA	ES2153
28	Use in photography products	21	20	30	NA	8a	NA	ES2171
29	Use in photography products	22	20	NA	5, 13	8a	NA	ES2159

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### 1. Short title of Exposure Scenario 1: Use as an intermediate

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU9: Manufacture of fine chemicals
Chemical product category	PC19: Intermediate
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

### 2.1 Contributing scenario controlling environmental exposure for: ERC6a

Amount used	Amounts used in the EU (tonnes/year)	12000 ton(s)/year
	Regional use tonnage (tons/year):	3000 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual amount per site	3000 ton(s)/year
	Daily amount per site	10000 kg/day
Frequency and duration of use	Continuous exposure	300 Emission days (days/year):
Environment factors not influenced by risk management	Dilution Factor (River)	40
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0.7 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Do not flush into surface water or sanitary sewer system., Do not release undiluted and unneutralized to the sewer., Regular control of the pH value during introduction into open waters is required.
		The substance is biodegradable, has a low Kow and is not expected to bioaccumulate
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Onsite sewage treatment plant
	Flow rate of sewage treatment plant effluent	10,000 m3/d
	Sludge Treatment	Recovery of sludge for agriculture or horticulture
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Solid wastes should be disposed of via landfill or incineration, Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
		Contain and dispose of waste in accordance with environmental legislation and according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC4, PROC8b



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Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	1 Times per day
Human factors not influenced by risk management	Exposed skin areas	Palm of one hand (240cm <sup>2</sup> ) (PROC1, PROC3)
	Exposed skin areas	Palms of both hands (480 cm <sup>2</sup> ) (PROC2, PROC4, PROC8b)
	Body weight	70 kg
	Respiration volume under conditions of use	10 m <sup>3</sup> /day
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a predominantly closed system provided with extract ventilation. Handle in a fume cupboard or under extract ventilation. Dust must be extracted directly at the point of origin. Take measures to prevent the build up of electrostatic charge. Use explosion-proof equipment. Avoid splashing.	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %) (PROC2, PROC4)	
	Provide local exhaust ventilation (LEV). (Efficiency: 95 %) (PROC8b)	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection Wear protective clothing. LEV and respiratory protection to be taken in areas where workers may come into contact with dust Avoid contact with the substance or contaminated objects Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0154mg/L	0.035
---	Annual average	Fresh water	PEC	0.0154mg/L	0.035
---	---	Fresh water sediment	PEC	0.263mg/kg wwt	0.035
---	---	Marine water	PEC	0.0084mg/L	0.191
---	Annual average	Marine water	PEC	0.00716mg/L	---
---	---	Marine sediment	PEC	0.144mg/kg wwt	0.191
---	30 days	Agricultural soil	PEC	0.0411mg/kg wwt	0.00141
---	180 days	Agricultural soil	PEC	0.0135mg/kg	---

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				wwt	
---	180 days	Grassland	PEC	0.00539mg/kg wwt	---
---	---	Pore water of agricultural soil	PEC	0.000203mg/L	---
---	---	Pore water of grassland	PEC	0.0000813mg/L	---
---	---	Groundwater under agricultural soil	PEC	0.000203mg/L	---

### Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal	0.3mg/kg/day	---
PROC2	---	Dermal	0.14mg/kg/day	---
PROC4, PROC8b	---	Dermal	0.69mg/kg/day	---
PROC1	---	Inhalation	0.01mg/m <sup>3</sup>	---
PROC2	---	Inhalation	0.1mg/m <sup>3</sup>	---
PROC4	---	Inhalation	2.5mg/m <sup>3</sup>	---
PROC8b	---	Inhalation	1.25mg/m <sup>3</sup>	---

In the ECETOC TRA model, LEV is not considered for PROC1

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

##### Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

For scaling see: <http://www.ecetoc.org/tra>

##### Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

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### 1. Short title of Exposure Scenario 2: Formulation & (re)packing of substances and mixtures

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU5: Manufacture of textiles, leather, fur SU 10: 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
Chemical product category	PC1: Adhesives, sealants PC3: Air care products PC9a: Coatings and paints, thinners, paint removers PC9b: Fillers, putties, plasters, modelling clay PC12: Fertilizers 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 categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	ERC1: Manufacture of substances ERC2: Formulation of preparations ERC3: Formulation in materials ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2, ERC3, ERC4

Amount used	Amounts used in the EU (tonnes/year)	10000 ton(s)/year
	Regional use tonnage (tons/year):	10000 ton(s)/year
	Fraction of EU tonnage used in region:	0.6
	Annual amount per site	6000 ton(s)/year
	Daily amount per site	20000 kg/day
Frequency and duration of use	Continuous exposure	300 Emission days (days/year):
Other given operational	Emission or Release	0.25 %

## CITRIC ACID ANHYDROUS

conditions affecting environmental exposure	Factor: Air	
	Emission or Release Factor: Water	0.05 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Removal of solids in settling tanks, Do not flush into surface water or sanitary sewer system., Do not release undiluted and unneutralized to the sewer., Regular control of the pH value during introduction into open waters is required.
		The substance is biodegradable, has a low Kow and is not expected to bioaccumulate
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	10,000 m3/d
	Sludge Treatment	Recovery of sludge for agriculture or horticulture
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Solid wastes should be disposed of via landfill or incineration, Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
		Contain and dispose of waste in accordance with environmental legislation and according to local regulations.
<b>2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC19</b>		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 4 h
	Frequency of use	1 Times per day
Human factors not influenced by risk management	Exposed skin areas	Palm of one hand (240cm <sup>2</sup> ) (PROC1, PROC3, PROC15)
	Exposed skin areas	Palms of both hands (480 cm <sup>2</sup> ) (PROC2, PROC4, PROC5, PROC8b, PROC9, PROC13, PROC14)
	Body weight	70 kg
	Breathing volume	10 m <sup>3</sup> /day
Technical conditions and measures to control dispersion from source towards the worker		Provide appropriate exhaust ventilation at places where dust is formed. Handle substance within a predominantly closed system provided with extract ventilation. Handle in a fume cupboard or under extract ventilation. Take measures to prevent the build up of electrostatic charge. Use explosion-proof equipment. Avoid splashing.
		Provide local exhaust ventilation (LEV). (Efficiency: 90 %)
Organisational measures to prevent /limit releases, dispersion and exposure		Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed
Conditions and measures related to personal protection, hygiene and health evaluation		Butyl rubber gloves offer good protection Wear protective clothing. Safety glasses Wear face protection.
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Avoid contact with the substance or contaminated objects  
Use of PPE will minimize contact during handling.

### 3. Exposure estimation and reference to its source

#### Environment

EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0158mg/L	0.0359
---	Annual average	Fresh water	PEC	0.0157mg/L	---
---	---	Fresh water sediment	PEC	0.27mg/kg wwt	0.0359
---	---	Marine water	PEC	0.0194mg/L	0.441
---	Annual average	Marine water	PEC	0.0162mg/L	---
---	---	Marine sediment	PEC	0.331mg/kg wwt	---
---	30 days	Agricultural soil	PEC	0.106mg/kg wwt	0.00362
---	180 days	Agricultural soil	PEC	0.347mg/kg wwt	---
---	180 days	Grassland	PEC	0.0139mg/kg wwt	---
---	---	Pore water of agricultural soil	PEC	0.000523mg/L	---
---	---	Pore water of grassland	PEC	0.000209mg/L	---

#### Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	---	Dermal	0.34mg/kg/day	---
PROC2	---	Dermal	0.14mg/kg/day	---
PROC3, PROC15	---	Dermal	0.034mg/kg/day	---
PROC4, PROC8b, PROC9, PROC13	---	Dermal	0.69mg/kg/day	---
PROC5, PROC8a	---	Dermal	1.37mg/kg/day	---
PROC7	---	Dermal	4.29mg/kg/day	---
PROC14	---	Dermal	0.34mg/kg/day	---
PROC19	---	Dermal	14.1mg/kg/day	---
PROC1, PROC13	---	Inhalation	0.01mg/m <sup>3</sup>	---
PROC2, PROC3	---	Inhalation	0.1mg/m <sup>3</sup>	---
PROC4, PROC5, PROC8b	---	Inhalation	2.5mg/m <sup>3</sup>	---
PROC7	---	Inhalation	10mg/m <sup>3</sup>	---

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PROC8a	---	Inhalation	5mg/m <sup>3</sup>	---
PROC9	---	Inhalation	2mg/m <sup>3</sup>	---
PROC14	---	Inhalation	1mg/m <sup>3</sup>	---
PROC15	---	Inhalation	0.5mg/m <sup>3</sup>	---
PROC19	---	Inhalation	0.05mg/m <sup>3</sup>	---

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

For scaling see: <http://www.ecetoc.org/tra>

Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 3: Use in polymers and plastic

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical product category	PC32: Polymer preparations and compounds
Process categories	PROC3: Use in closed batch process (synthesis or formulation) PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids

### 2.1 Contributing scenario controlling environmental exposure for: ERC6b

Amount used	Amounts used in the EU (tonnes/year)	200 ton(s)/year
	Regional use tonnage (tons/year):	20 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual amount per site	20 ton(s)/year
	Daily amount per site	67 kg/day
Frequency and duration of use	Continuous exposure	300 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0.65 %
	Regional only	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
		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
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
		Contain and dispose of waste in accordance with environmental legislation and according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC3, PROC5, PROC8a, PROC8b

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	solid, liquid
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing. Provide adequate ventilation.	
Organisational measures to	Clean equipment and the work area every day.	

**CITRIC ACID ANHYDROUS**

prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection LEV and respiratory protection to be taken in areas where workers may come into contact with dust Avoid contact with the substance or contaminated objects Use of PPE will minimize contact during handling.

**3. Exposure estimation and reference to its source**

**Environment**  
No information available.

**Workers**  
Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.



## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 4: Uses in coatings

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU18: Manufacture of furniture SU19: Building and construction work
Chemical product category	PC9a: Coatings and paints, thinners, paint removers PC9b: Fillers, putties, plasters, modelling clay PC18: Ink and toners PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Process categories	PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC19: Hand-mixing with intimate contact and only PPE available PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles
Article categories	AC4: Stone, plaster, cement, glass and ceramic articles AC11: Wood articles
Environmental Release Categories	ERC5: Industrial use resulting in inclusion into or onto a matrix

### 2.1 Contributing scenario controlling environmental exposure for: ERC5

Amount used	Amounts used in the EU (tonnes/year)	300 ton(s)/year
	Regional use tonnage (tons/year):	40 ton(s)/year
	Fraction of Regional tonnage used locally:	0.25
	Annual amount for wide disperse uses	10 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
		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
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
		Contain and dispose of waste in accordance with environmental legislation and according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC7, PROC8a, PROC8b, PROC10, PROC19, PROC24

Product characteristics	Physical Form (at time of use)	solid, liquid
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## CITRIC ACID ANHYDROUS

Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing. Provide adequate ventilation.
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection Use of PPE will minimize contact during handling.

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 5: Uses in coatings

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC9a: Coatings and paints, thinners, paint removers PC9b: Fillers, putties, plasters, modelling clay PC18: Ink and toners PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Article categories	AC4: Stone, plaster, cement, glass and ceramic articles AC11: Wood articles
Environmental Release Categories	ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release ERC10b: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing) ERC11a: Wide dispersive indoor use of long-life articles and materials with low release ERC11b: Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing)

#### 2.1 Contributing scenario controlling environmental exposure for: ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b

Amount used	Amounts used in the EU (tonnes/year)	300 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	2 %
	local release rate	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

#### 2.2 Contributing scenario controlling consumer exposure for: PC9a, PC9b, PC18, PC34

Product characteristics	Physical Form (at time of use)	liquid, solid
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Exposure to low concentrations during application/use	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

**CITRIC ACID ANHYDROUS**

**Consumers**

No information available.

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

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 6: Uses in coatings

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU18: Manufacture of furniture SU19: Building and construction work
Chemical product category	PC9a: Coatings and paints, thinners, paint removers PC9b: Fillers, putties, plasters, modelling clay PC18: Ink and toners PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Process categories	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC19: Hand-mixing with intimate contact and only PPE available PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles
Article categories	AC4: Stone, plaster, cement, glass and ceramic articles AC11: Wood articles
Environmental Release Categories	ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release ERC10b: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing) ERC11a: Wide dispersive indoor use of long-life articles and materials with low release ERC11b: Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing)

### 2.1 Contributing scenario controlling environmental exposure for: ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b

Amount used	Amounts used in the EU (tonnes/year)	300 ton(s)/year
	Regional use tonnage (tons/year):	40 ton(s)/year
	Fraction of Regional tonnage used locally:	0.25
	Annual amount for wide disperse uses	10 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

## CITRIC ACID ANHYDROUS

### 2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC10, PROC11, PROC19, PROC24

Product characteristics	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure time	> 4 h
Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 7: Use in Cleaning Agents

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Chemical 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 categories	PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring
Article categories	AC8: Paper articles
Environmental Release Categories	ERC2: Formulation of preparations ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4

Readily biodegradable.

Amount used	Amounts used in the EU (tonnes/year)	100000 ton(s)/year
	Regional use tonnage (tons/year):	10000 ton(s)/year
	Fraction of Regional tonnage used locally:	0.0005
	Annual amount per site	5000 kg/year
	Daily amount per site	14 kg/day
Frequency and duration of use	Continuous exposure	365 Emission days (days/year):
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	100 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Water	Do not flush into surface water or sanitary sewer system., Do not release undiluted and unneutralized to the sewer., Regular control of the pH value during introduction into open waters is required.
		The substance is biodegradable, has a low Kow and is not expected to bioaccumulate

## CITRIC ACID ANHYDROUS

Organizational measures to prevent/limit release from the site		
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Onsite sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m <sup>3</sup> /d
	Sludge Treatment	Recovery of sludge for agriculture or horticulture
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Solid wastes should be disposed of via landfill or incineration, Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling worker exposure for: PROC2, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations more than 25%
	Physical Form (at time of use)	liquid, solid
Frequency and duration of use	Exposure time	> 4 h
	Frequency of use	1 Times per day
Human factors not influenced by risk management	Exposed skin areas	Palms of both hands (480 cm <sup>2</sup> ) (PROC5, PROC8b, PROC13)
	Breathing volume	10 m <sup>3</sup> /day
	Body weight	70 kg
Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing.	
	Provide local exhaust ventilation (LEV). (Efficiency: 95 %)(PROC7)	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	Butyl rubber gloves offer good protection Safety glasses Wear protective clothing. Avoid contact with the substance or contaminated objects Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0248mg/L	0.0563
---	Annual average	Fresh water	PEC	0.0248mg/L	---
---	---	Fresh water sediment	PEC	0.423mg/kg wwt	0.0563
---	---	Marine water	PEC	0.00237mg/L	0.0539
---	Annual average	Marine water	PEC	0.00237mg/L	---
---	---	Marine sediment	PEC	0.0405mg/kg	0.0539



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				wwt	
---	30 days	Agricultural soil	PEC	0.402mg/kg wwt	0.0138
---	180 days	Agricultural soil	PEC	0.132mg/kg wwt	---
---	180 days	Grassland	PEC	0.0527mg/kg wwt	---
---	---	Pore water of agricultural soil	PEC	0.00199mg/L	---
---	---	Pore water of grassland	PEC	0.000795mg/L	---
---	---	Groundwater under agricultural soil	PEC	0.00199mg/L	---

### Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC7	---	Dermal	2.14mg/kg/day	---
PROC8a	---	Dermal	13.7mg/kg/day	---
PROC8b	---	Dermal	6.9mg/kg/day	---
PROC10	---	Dermal	27.4mg/kg/day	---
PROC13	---	Dermal	13.7mg/kg/day	---
PROC7	---	Inhalation	0.71mg/m <sup>3</sup>	---
PROC8a, PROC10	---	Inhalation	0.07mg/m <sup>3</sup>	---
PROC8b, PROC13	---	Inhalation	0.014mg/m <sup>3</sup>	---

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

##### Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

For scaling see: <http://www.ecetoc.org/tra>

##### Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 8: Use in Cleaning Agents

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical 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
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d, ERC9a, ERC9b

Readily biodegradable.

Amount used	Amounts used in the EU (tonnes/year)	100000 ton(s)/year
	Regional use tonnage (tons/year):	10000 ton(s)/year
	Fraction of Regional tonnage used locally:	0.0005
	Annual amount for wide disperse uses	14 kg/day
Frequency and duration of use	Continuous exposure	365 Emission days (days/year):
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	100 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
		The substance is biodegradable, has a low Kow and is not expected to bioaccumulate
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m <sup>3</sup> /d
	Sludge Treatment	Recovery of sludge for agriculture or horticulture
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Solid wastes should be disposed of via landfill or incineration
		Contain and dispose of waste in accordance with environmental legislation and according to local regulations.

### 2.2 Contributing scenario controlling consumer exposure for: PC3, PC28, PC31, PC35, PC36, PC37

## CITRIC ACID ANHYDROUS

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations more than 25%
	Physical Form (at time of use)	liquid, solid
Human factors not influenced by risk management	Body weight	65 kg
	Breathing volume	26 m <sup>3</sup>
	Light activity	
	Exposed skin surface	960 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Ventilation rate per hour	0.6
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Long term exposure to low concentrations during application/use	

### 3. Exposure estimation and reference to its source

#### Environment

EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0248mg/L	0.0563
---	Annual average	Fresh water	PEC	0.0248mg/L	0.0563
---	---	Fresh water sediment	PEC	0.423mg/kg wwt	0.0563
---	---	Marine water	PEC	0.00237mg/L	0.0539
---	Annual average	Marine water	PEC	0.00237mg/L	0.0539
---	---	Marine sediment	PEC	0.0405mg/kg wwt	0.0539
---	30 days	Agricultural soil	PEC	0.402mg/kg wwt	0.0138
---	180 days	Agricultural soil	PEC	0.132mg/kg wwt	---
---	180 days	Grassland	PEC	0.0527mg/kg wwt	---
---	---	Pore water of agricultural soil	PEC	0.00199mg/L	---
---	---	Pore water of grassland	PEC	0.000795mg/L	---
---	---	Groundwater under agricultural soil	PEC	0.00199mg/L	---

#### Consumers

No information available.

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

## **CITRIC ACID ANHYDROUS**

The ConsExpo model has been used to estimate consumer exposures unless otherwise indicated.  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

### **Additional good practice advice beyond the REACH Chemical Safety Assessment**

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 9: Use in Cleaning Agents

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Chemical 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 categories	PROC1: Use in closed process, no likelihood of exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC19: Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d, ERC9a, ERC9b

Readily biodegradable.

Amount used	Amounts used in the EU (tonnes/year)	100000 ton(s)/year
	Regional use tonnage (tons/year):	10000 ton(s)/year
	Fraction of Regional tonnage used locally:	0.0005
	Daily amount for wide dispersive uses	14 kg/day
Frequency and duration of use	Continuous exposure	365 Emission days (days/year):
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	100 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
		The substance is biodegradable, has a low Kow and is not expected to bioaccumulate

## CITRIC ACID ANHYDROUS

Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m <sup>3</sup> /d
	Sludge Treatment	Recovery of sludge for agriculture or horticulture
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Solid wastes should be disposed of via landfill or incineration
	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC4, PROC8a, PROC9, PROC10, PROC11, PROC13, PROC19

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations more than 25%
	Physical Form (at time of use)	liquid, solid
Frequency and duration of use	Exposure time	15 - 30 min
	Frequency of use	1 Times per day
Human factors not influenced by risk management	Exposed skin areas	Palms of both hands (480 cm <sup>2</sup> ) (PROC8b, PROC9, PROC13)
	Breathing volume	10 m <sup>3</sup> /day
	Body weight	70 kg
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing. Provide appropriate exhaust ventilation at places where dust is formed.	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection LEV and respiratory protection to be taken in areas where workers may come into contact with dust Avoid contact with the substance or contaminated objects Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0248mg/L	0.0563
---	Annual average	Fresh water	PEC	0.0248mg/L	---
---	---	Fresh water sediment	PEC	0.423mg/kg wwt	0.0563
---	---	Marine water	PEC	0.00237mg/L	0.0539
---	Annual average	Marine water	PEC	0.00237mg/L	---
---	---	Marine sediment	PEC	0.0405mg/kg wwt	0.0539
---	30 days	Agricultural soil	PEC	0.402mg/kg	0.0138

## CITRIC ACID ANHYDROUS

				wwt	
---	180 days	Agricultural soil	PEC	0.132mg/kg wwt	---
---	180 days	Grassland	PEC	0.0527mg/kg wwt	---
---	---	Pore water of agricultural soil	PEC	0.00199mg/L	---
---	---	Pore water of grassland	PEC	0.000795mg/L	---
---	---	Groundwater under agricultural soil	PEC	0.00199mg/L	---

### Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC8a	---	Dermal	13.7mg/kg/day	---
PROC9	---	Dermal	6.9mg/kg/day	---
PROC10	---	Dermal	27.4mg/kg/day	---
PROC13	---	Dermal	13.7mg/kg/day	---
PROC8a, PROC10	---	Inhalation	0.07mg/m <sup>3</sup>	---
PROC9	---	Inhalation	0.01mg/m <sup>3</sup>	---
PROC13	---	Inhalation	0.014mg/m <sup>3</sup>	---

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

##### Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

For scaling see: <http://www.ecetoc.org/tra>

##### Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented. Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 10: Use in agrochemicals

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU1: Agriculture, forestry, fishery
Chemical product category	PC8: Biocidal products PC12: Fertilizers PC21: Laboratory chemicals
Process categories	PROC3: Use in closed batch process (synthesis or formulation) PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available
Article categories	AC2: Machinery, mechanical appliances, electrical/electronic articles
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

### 2.1 Contributing scenario controlling environmental exposure for: ERC4

Amount used	Amounts used in the EU (tonnes/year)	1500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	10 %
	Emission or Release Factor: Soil	90 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	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	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge

### 2.2 Contributing scenario controlling worker exposure for: PROC3, PROC5, PROC8a, PROC8b, PROC10, PROC14, PROC15, PROC19

Product characteristics	Physical Form (at time of use)	solid, liquid
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing. Provide appropriate exhaust ventilation at places where dust is formed.	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures	
Conditions and measures related to personal protection, hygiene	If technical exhaust or ventilation measures are not possible or insufficient,	



**CITRIC ACID ANHYDROUS**

and health evaluation

respiratory protection must be worn.  
Wear face protection.  
Butyl rubber gloves offer good protection  
LEV and respiratory protection to be taken in areas where workers may come into contact with dust  
Avoid contact with the substance or contaminated objects

**3. Exposure estimation and reference to its source****Environment**

No information available.

**Workers**

No information available.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 11: Use in agrochemicals

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Sectors of end-use	SU1: Agriculture, forestry, fishery
Chemical product category	PC8: Biocidal products PC12: Fertilizers PC21: Laboratory chemicals
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems

### 2.1 Contributing scenario controlling environmental exposure for: ERC8b, ERC8d

Amount used	Amounts used in the EU (tonnes/year)	1500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	10 %
	Emission or Release Factor: Soil	90 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	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	

### 2.2 Contributing scenario controlling consumer exposure for: PC8, PC12, PC21

Product characteristics	Physical Form (at time of use)	solid, liquid
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Wear suitable protective clothing, gloves and eye/face protection.

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Consumers

No information available.

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

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 12: Use in agrochemicals

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU1: Agriculture, forestry, fishery
Chemical product category	PC8: Biocidal products PC12: Fertilizers PC21: Laboratory chemicals
Process categories	PROC3: Use in closed batch process (synthesis or formulation) PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC15: Use as laboratory reagent PROC19: Hand-mixing with intimate contact and only PPE available
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems

### 2.1 Contributing scenario controlling environmental exposure for: ERC8b, ERC8d

Amount used	Amounts used in the EU (tonnes/year)	1500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	10 %
	Emission or Release Factor: Soil	90 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	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	

### 2.2 Contributing scenario controlling worker exposure for: PROC3, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC14, PROC15, PROC19

Product characteristics	Physical Form (at time of use)	solid, liquid
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing. Provide appropriate exhaust ventilation at places where dust is formed.	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection LEV and respiratory protection to be taken in areas where workers may come into contact with dust	

**CITRIC ACID ANHYDROUS**

Avoid contact with the substance or contaminated objects

**3. Exposure estimation and reference to its source****Environment**

No information available.

**Workers**

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 13: Use in laboratories

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC7: Industrial use of substances in closed systems

### 2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7

Amount used	Amounts used in the EU (tonnes/year)	1000 ton(s)/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC4, PROC8a

Product characteristics	Physical Form (at time of use)	liquid, solid
Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing.	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection Avoid contact with the substance or contaminated objects Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

No information available.

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

**CITRIC ACID ANHYDROUS**

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 14: Use in building and construction work

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU2: Mining (including offshore industries) SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) SU19: Building and construction work
Process categories	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC19: Hand-mixing with intimate contact and only PPE available PROC21: Low energy manipulation of substances bound in materials and/or articles PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles
Article categories	AC4: Stone, plaster, cement, glass and ceramic articles
Environmental Release Categories	ERC5: Industrial use resulting in inclusion into or onto a matrix ERC12a: Industrial processing of articles with abrasive techniques (low release)

### 2.1 Contributing scenario controlling environmental exposure for: ERC5, ERC12a

Amount used	Regional use tonnage (tons/year):	1500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	10 %
	Emission or Release Factor: Soil	90 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	The substance is biodegradable, has a low Kow and is not expected to bioaccumulate	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling worker exposure for: PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC14, PROC19, PROC21, PROC24

Product characteristics	Concentration of the Substance in	Covers percentage substance in the product up to 1 %.
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## CITRIC ACID ANHYDROUS

	Mixture/Article	
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure time	> 4 h
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing. Provide adequate ventilation.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection LEV and respiratory protection to be taken in areas where workers may come into contact with dust	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.



## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 15: Use in building and construction work

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Sectors of end-use	SU2: Mining (including offshore industries) SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) SU19: Building and construction work
Chemical product category	PC0: Other products: PC1: Adhesives, sealants PC9b: Fillers, putties, plasters, modelling clay
Article categories	AC4: Stone, plaster, cement, glass and ceramic articles
Environmental Release Categories	ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release ERC10b: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing) ERC11a: Wide dispersive indoor use of long-life articles and materials with low release ERC11b: Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing)

#### 2.1 Contributing scenario controlling environmental exposure for: ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b

Amount used	Regional use tonnage (tons/year):	1500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	10 %
	Emission or Release Factor: Soil	90 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

#### 2.2 Contributing scenario controlling consumer exposure for: PC0, PC1, PC9b

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	liquid, solid
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Long term exposure to low concentrations during application/use	

### 3. Exposure estimation and reference to its source

**CITRIC ACID ANHYDROUS****Environment**

No information available.

**Consumers**

No information available.

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

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 16: Use in building and construction work

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU2: Mining (including offshore industries) SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) SU19: Building and construction work
Process categories	PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC19: Hand-mixing with intimate contact and only PPE available PROC21: Low energy manipulation of substances bound in materials and/or articles PROC24: High (mechanical) energy work-up of substances bound in materials and/or articles
Article categories	AC4: Stone, plaster, cement, glass and ceramic articles
Environmental Release Categories	ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release ERC10b: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing) ERC11a: Wide dispersive indoor use of long-life articles and materials with low release ERC11b: Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing)

### 2.1 Contributing scenario controlling environmental exposure for: ERC8c, ERC8f, ERC10a, ERC10b, ERC11a, ERC11b

Amount used	Regional use tonnage (tons/year):	1500 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	10 %
	Emission or Release Factor: Soil	90 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

## CITRIC ACID ANHYDROUS

disposal

### 2.2 Contributing scenario controlling worker exposure for: PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC14, PROC19, PROC21, PROC24

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure time	> 4 h
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 17: Use in process water treatment

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	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
Chemical product category	PC4: Anti-freeze and de-icing products PC7: Base metals and alloys PC14: Metal surface treatment products, including galvanic and electroplating products PC16: Heat transfer fluids PC17: Hydraulic fluids PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents PC25: Metal working fluids PC35: Washing and cleaning products (including solvent based products) PC37: Water treatment chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC18: Greasing at high energy conditions PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC7: Industrial use of substances in closed systems

### 2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7

Amount used	Amounts used in the EU (tonnes/year)	1000 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	100 %
	Regional only	
Technical conditions and measures at process level (source) to prevent release	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	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
Organizational measures to		

## CITRIC ACID ANHYDROUS

prevent/limit release from the site

Conditions and measures related to external treatment of waste for disposal

Waste treatment

Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge

Contain and dispose of waste in accordance with environmental legislation and according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC18, PROC20

Product characteristics

Physical Form (at time of use)

liquid, solid

Frequency and duration of use

Exposure time

> 4 h

Technical conditions and measures to control dispersion from source towards the worker

Take measures to prevent the build up of electrostatic charge.  
Avoid splashing.  
Provide appropriate exhaust ventilation at places where dust is formed.

Organisational measures to prevent /limit releases, dispersion and exposure

Clean equipment and the work area every day.  
Provide basic employee training to prevent/minimize exposures  
Supervision in place to check that the RMMs in place are being used correctly and OC's followed

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

If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.  
Wear face protection.  
Butyl rubber gloves offer good protection  
LEV and respiratory protection to be taken in areas where workers may come into contact with dust  
Avoid contact with the substance or contaminated objects  
Use of PPE will minimize contact during handling.

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 18: Use in oil industry

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU2a: Mining (without offshore industries) SU2b: Offshore industries
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents PC40: Extraction agents
Process categories	PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

### 2.1 Contributing scenario controlling environmental exposure for: ERC4

Amount used	Amounts used in the EU (tonnes/year)	900 ton(s)/year
	Regional use tonnage (tons/year):	100 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Water	100 %
	Regional only	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling worker exposure for: PROC3, PROC4, PROC5

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 20% - 50%
	Physical Form (at time of use)	liquid, solid
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing. Provide appropriate exhaust ventilation at places where dust is formed.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear face protection. Butyl rubber gloves offer good protection LEV and respiratory protection to be taken in areas where workers may come	

**CITRIC ACID ANHYDROUS**

into contact with dust  
Use of PPE will minimize contact during handling.  
If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.

**3. Exposure estimation and reference to its source****Environment**

No information available.

**Workers**

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.



## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 19: Use in metal surface treatment.

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	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
Chemical product category	PC7: Base metals and alloys PC14: Metal surface treatment products, including galvanic and electroplating products PC25: Metal working fluids PC31: Polishes and wax blends PC35: Washing and cleaning products (including solvent based products)
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC17: Lubrication at high energy conditions and in partly open process PROC18: Greasing at high energy conditions PROC23: Open processing and transfer operations with minerals/metals at elevated temperature
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC6b: Industrial use of reactive processing aids

### 2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC6b

Amount used	Amounts used in the EU (tonnes/year)	1000 ton(s)/year
Frequency and duration of use	Continuous exposure	365 days/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised. 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
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge Contain and dispose of waste in accordance with environmental legislation and according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC7,

## CITRIC ACID ANHYDROUS

### PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18, PROC23

Product characteristics	Physical Form (at time of use)	liquid, solid
Frequency and duration of use	Exposure time	> 4 h
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing. Provide appropriate exhaust ventilation at places where dust is formed.	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection LEV and respiratory protection to be taken in areas where workers may come into contact with dust Avoid contact with the substance or contaminated objects Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 20: Use in cosmetics

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Sectors of end-use	SU20: Health services
Chemical product category	PC2: Adsorbents PC39: Cosmetics, personal care products
Article categories	AC8: Paper articles
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC11a: Wide dispersive indoor use of long-life articles and materials with low release
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC11a

Amount used	Amounts used in the EU (tonnes/year)	750 ton(s)/year
	Regional use tonnage (tons/year):	750 ton(s)/year
	Fraction of Regional tonnage used locally:	0.0005
	Daily amount for wide dispersive uses	1.03 kg/day
Frequency and duration of use	Continuous exposure	365 Emission days (days/year):
Environment factors not influenced by risk management	Dilution Factor (River)	900
	Dilution Factor (Coastal Areas)	1,000
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	100 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Sludge Treatment	Recovery of sludge for agriculture or horticulture
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Solid wastes should be disposed of via landfill or incineration
	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling consumer exposure for: PC2, PC3, PC39

Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Long term exposure to low concentrations during application/use
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### 3. Exposure estimation and reference to its source

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## CITRIC ACID ANHYDROUS

### Environment

EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0159mg/m <sup>3</sup>	0.0361
---	Annual average	Fresh water	PEC	0.0159mg/L	0.0361
---	---	Fresh water sediment	PEC	0.271mg/kg wwt	---
---	---	Marine water	PEC	0.00148mg/L	0.0337
---	Annual average	Marine water	PEC	0.00148mg/L	0.0337
---	---	Marine sediment	PEC	0.0253mg/kg wwt	---
---	30 days	Agricultural soil	PEC	0.0302mg/kg wwt	0.00103
---	180 days	Agricultural soil	PEC	0.00989mg/kg wwt	---
---	180 days	Grassland	PEC	0.00395mg/kg wwt	---
---	---	Pore water of agricultural soil	PEC	0.000149mg/L	---
---	---	Pore water of grassland	PEC	0.0000597mg/L	---
---	---	Groundwater under agricultural soil	PEC	0.000149mg/L	---

### Consumers

No information available.

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

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 21: Use in cosmetics

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU20: Health services
Chemical product category	PC2: Adsorbents PC39: Cosmetics, personal care products
Process categories	PROC10: Roller application or brushing PROC11: Non industrial spraying PROC19: Hand-mixing with intimate contact and only PPE available
Article categories	AC8: Paper articles
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC11a: Wide dispersive indoor use of long-life articles and materials with low release
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC11a

Amount used	Amounts used in the EU (tonnes/year)	7500 ton(s)/year
	Regional use tonnage:	750 ton(s)/year
	Fraction of Regional tonnage used locally:	0.0005
	Daily amount for wide dispersive uses	1.03 kg/day
Frequency and duration of use	Continuous exposure	365 Emission days (days/year):
Environment factors not influenced by risk management	Dilution Factor (River)	900
	Dilution Factor (Coastal Areas)	1,000
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	100 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
		The substance is biodegradable, has a low Kow and is not expected to bioaccumulate
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Sludge Treatment	Recovery of sludge for agriculture or horticulture
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Solid wastes should be disposed of via landfill or incineration
		Contain and dispose of waste in accordance with environmental legislation and according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC10, PROC11, PROC19

Product characteristics	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 4 h

## CITRIC ACID ANHYDROUS

Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge. Avoid splashing. Provide appropriate exhaust ventilation at places where dust is formed.
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day. Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection Use of PPE will minimize contact during handling.

### 3. Exposure estimation and reference to its source

#### Environment

EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0159mg/m <sup>3</sup>	0.0361
---	Annual average	Fresh water	PEC	0.0159mg/L	---
---	---	Fresh water sediment	PEC	0.271mg/kg wwt	0.0361
---	---	Marine water	PEC	0.00148mg/L	0.0337
---	Annual average	Marine water	PEC	0.00148mg/L	0.0337
---	---	Marine sediment	PEC	0.0253mg/kg wwt	0.0337
---	30 days	Agricultural soil	PEC	0.0302mg/kg wwt	0.00103
---	180 days	Agricultural soil	PEC	0.00989mg/kg wwt	---
---	180 days	Grassland	PEC	0.00395mg/kg wwt	---
---	---	Pore water of agricultural soil	PEC	0.000149mg/L	---
---	---	Pore water of grassland	PEC	0.0000597mg/L	---
---	---	Groundwater under agricultural soil	PEC	0.000149mg/L	---

#### Workers

No information available.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

**CITRIC ACID ANHYDROUS**

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 22: Use in medical devices

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU20: Health services
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents
Process categories	PROC1: Use in closed process, no likelihood of exposure
Article categories	AC7: Metal articles
Environmental Release Categories	ERC7: Industrial use of substances in closed systems
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC7

Amount used	Amounts used in the EU (tonnes/year)	1000 ton(s)/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Dispose of waste product or used containers according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC1

Product characteristics	Physical Form (at time of use)	solid, liquid
Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing. Clear spills immediately. Provide local exhaust ventilation (LEV). Take measures to prevent the build up of electrostatic charge. Provide for sufficient ventilation.	
Organisational measures to prevent /limit releases, dispersion and exposure	Regular cleaning of equipment and work area Ensure operatives are trained to minimise exposures. Supervision in place to check that the RMMs in place are being used correctly and OC's followed Ensure that eyewash stations and safety showers are close to the workstation location.	
Conditions and measures related to personal protection, hygiene and health evaluation	Appropriate dust respiratory protection In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection Wear suitable protective gloves and eye/face protection. Wear safety goggles or Face-shield Avoid contact with contaminated tools and objects Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

Qualitative approach used to conclude safe use.



**CITRIC ACID ANHYDROUS****Workers**

No exposure assessment presented for human health.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 23: Use in medical devices

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Sectors of end-use	SU20: Health services
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC8d

Amount used	Amounts used in the EU (tonnes/year)	1000 ton(s)/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Dispose of waste product or used containers according to local regulations.

### 2.2 Contributing scenario controlling consumer exposure for: PC20

Readily biodegradable., Does not bioaccumulate.

Product characteristics	Physical Form (at time of use)	solid, liquid
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### 3. Exposure estimation and reference to its source

#### Environment

Qualitative approach used to conclude safe use.

#### Consumers

No exposure assessment presented for human health.

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

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 24: Use in medical devices

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU20: Health services
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents
Process categories	PROC1: Use in closed process, no likelihood of exposure
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered

### 2.1 Contributing scenario controlling environmental exposure for: ERC8d

Amount used	Amounts used in the EU (tonnes/year)	1000 ton(s)/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Disposal methods	Dispose of waste product or used containers according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC1

Product characteristics	Physical Form (at time of use)	solid, liquid
Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing. Clear spills immediately. Provide local exhaust ventilation (LEV). Take measures to prevent the build up of electrostatic charge. Provide for sufficient ventilation.	
Organisational measures to prevent /limit releases, dispersion and exposure	Regular cleaning of equipment and work area Ensure operatives are trained to minimise exposures. Supervision in place to check that the RMMs in place are being used correctly and OC's followed Ensure that eyewash stations and safety showers are close to the workstation location.	
Conditions and measures related to personal protection, hygiene and health evaluation	Appropriate dust respiratory protection In case of odour, gas alarm or insufficient ventilation wear suitable respiratory protection Wear suitable protective gloves and eye/face protection. Wear safety goggles or Face-shield Avoid contact with contaminated tools and objects Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 25: Use in textile industry

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU5: Manufacture of textiles, leather, fur
Chemical product category	PC20: Products such as ph-regulators, flocculants, precipitants, neutralization agents PC23: Leather tanning, dye, finishing, impregnation and care products PC24: Lubricants, greases, release products
Process categories	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring PROC22: Potentially closed processing operations with minerals/metals at elevated temperature; industrial setting
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

### 2.1 Contributing scenario controlling environmental exposure for: ERC4

Readily biodegradable.

Amount used	Amounts used in the EU (tonnes/year)	300 ton(s)/year
	Fraction of Regional tonnage used locally:	0.05
	Regional use tonnage (tons/year):	120 ton(s)/year
	Annual amount per site	6000 kg/year
	Daily amount per site	20 kg/day
Frequency and duration of use	Continuous exposure	300 Emission days (days/year):
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	100 %
	Based on the applied operational conditions, emission in the air and soil compartment are negligible	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Do not flush into surface water or sanitary sewer system., Do not release undiluted and unneutralized to the sewer., Regular control of the pH value during introduction into open waters is required.
	The substance is biodegradable, has a low Kow and is not expected to bioaccumulate	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2,000 m3/d
	Sludge Treatment	Recovery of sludge for agriculture or horticulture
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Solid wastes should be disposed of via landfill or incineration, Waste water treatment may vary at different sites. Wastewater should be at least

## CITRIC ACID ANHYDROUS

		treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC10, PROC13, PROC22

Product characteristics	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure time	> 4 h
Technical conditions and measures to control dispersion from source towards the worker	Take measures to prevent the build up of electrostatic charge.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Butyl rubber gloves offer good protection LEV and respiratory protection to be taken in areas where workers may come into contact with dust Use of PPE will minimize contact during handling.	

### 3. Exposure estimation and reference to its source

#### Environment

EUSES 2.1.1

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
---	---	Fresh water	PEC	0.0292mg/L	0.0663
---	Annual average	Fresh water	PEC	0.0267mg/L	---
---	---	Fresh water sediment	PEC	0.498mg/kg wwt	0.0663
---	---	Marine water	PEC	0.101mg/L	2.3
---	Annual average	Marine water	PEC	0.0835mg/L	---
---	---	Marine sediment	PEC	1.73mg/kg wwt	2.3
---	30 days	Agricultural soil	PEC	0.587mg/kg wwt	0.0201
---	180 days	Agricultural soil	PEC	0.193mg/kg wwt	---
---	180 days	Grassland	PEC	0.0770mg/kg wwt	---
---	---	Pore water of agricultural soil	PEC	0.00291mg/L	---
---	---	Pore water of grassland	PEC	0.00116mg/L	---
---	---	Groundwater under agricultural soil	PEC	0.00291mg/L	---

#### Workers

No information available.

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

**CITRIC ACID ANHYDROUS****Exposure Scenario**

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment

Estimated exposures are not expected to exceed PNEC when the identified Risk Management Measures / Operational Conditions are adopted, as indicated in Section 2

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 26: Use in paper industry

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU6b: Manufacture of pulp, paper and paper products
Chemical product category	PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids
Process categories	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

### 2.1 Contributing scenario controlling environmental exposure for: ERC4

Amount used	Amounts used in the EU (tonnes/year)	1000 ton(s)/year
	Regional use tonnage (tons/year):	100 ton(s)/year
	Fraction of Regional tonnage used locally:	1
	Annual amount per site	100 ton(s)/year
	Daily amount per site	333 kg/day
Frequency and duration of use	Continuous exposure	300 days/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
		The substance is biodegradable, has a low Kow and is not expected to bioaccumulate
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Waste water treatment may vary at different sites. Wastewater should be at least treated in either an on-site or a municipal secondary biological treatment plant prior to discharge
		Contain and dispose of waste in accordance with environmental legislation and according to local regulations.

### 2.2 Contributing scenario controlling worker exposure for: PROC5, PROC8a

Product characteristics	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure time	> 4 h
Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing. Provide adequate ventilation.	
Organisational measures to prevent /limit releases, dispersion and exposure	Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear face protection. Butyl rubber gloves offer good protection Avoid contact with the substance or contaminated objects Use of PPE will minimize contact during handling. In case of dust or aerosol formation: use respiratory protection with approved filter (P2)	



**CITRIC ACID ANHYDROUS****3. Exposure estimation and reference to its source****Environment**

No information available.

**Workers**

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 27: Use in photography products

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU20: Health services
Chemical product category	PC30: Photo-chemicals
Process categories	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

### 2.1 Contributing scenario controlling environmental exposure for: ERC4

Amount used	Amounts used in the EU (tonnes/year)	200 ton(s)/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	The substance is biodegradable, has a low Kow and is not expected to bioaccumulate	
Conditions and measures related to external treatment of waste for disposal	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling worker exposure for: PROC5, PROC13

Product characteristics	Physical Form (at time of use)	liquid, solid
Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that

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risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 28: Use in photography products

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Sectors of end-use	SU20: Health services
Chemical product category	PC30: Photo-chemicals
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a

Amount used	Amounts used in the EU (tonnes/year)	200 ton(s)/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	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	
Conditions and measures related to external treatment of waste for disposal	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling consumer exposure for: PC30

Product characteristics	Physical Form (at time of use)	solid, liquid
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Exposure to low concentrations during application/use	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Consumers

No information available.

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

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

#### Additional good practice advice beyond the REACH Chemical Safety Assessment

Take care for general good hygiene and housekeeping.

## CITRIC ACID ANHYDROUS

### 1. Short title of Exposure Scenario 29: Use in photography products

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU20: Health services
Process categories	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems

### 2.1 Contributing scenario controlling environmental exposure for: ERC8a

Amount used	Amounts used in the EU (tonnes/year)	200 ton(s)/year
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Water	Before discharge into sewage plants the product normally needs to be neutralised.
	The substance is biodegradable, has a low Kow and is not expected to bioaccumulate	
Conditions and measures related to external treatment of waste for disposal	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

### 2.2 Contributing scenario controlling worker exposure for: PROC5, PROC13

Product characteristics	Physical Form (at time of use)	liquid, solid
Frequency and duration of use	Exposure time	> 4 h
Technical conditions and measures to control dispersion from source towards the worker	Avoid splashing.	
Organisational measures to prevent /limit releases, dispersion and exposure	Provide basic employee training to prevent/minimize exposures Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
Conditions and measures related to personal protection, hygiene and health evaluation	If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear face protection. Butyl rubber gloves offer good protection	

### 3. Exposure estimation and reference to its source

#### Environment

No information available.

#### Workers

Qualitative approach used to conclude safe use.

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

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.  
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that

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risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.