



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

1.1 Product identifier: OXALIC ACID

Oxalic acid· 2H₂O

CAS: 6153-56-6

EC: 205-634-3

Index: 607-006-00-8

REACH: 01-2119534576-33-XXXX

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

Relevant uses: Raw materials for the cosmetics, pharmaceuticals and food industries. For professional user/industrial user only.

Uses advised against: All uses not specified in this section or in section 7.3

Please see the annex for detailed information about the specific and safe usage of the product.

1.3 Details of the supplier of the safety data sheet:

OXAQUIM, S.A.

Polígono Industrial Las Horcas s/n

44600 Alcañiz - Teruel - España

Phone.: +34 978 83 31 13 - Fax: +34 978 83 38 61

jsantafe@oxaquim.com

<https://www.oxaquim.com>

1.4 Emergency telephone number: +34 91 562 04 20 (24h) National Institute of Toxicology (Spain)

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

CLP Regulation (EC) No 1272/2008:

Classification of this product has been carried out in accordance with CLP Regulation (EC) No 1272/2008.

Acute Tox. 4: Acute toxicity, Category 4, H302+H312

Eye Dam. 1: Serious eye damage, Category 1, H318

2.2 Label elements:

CLP Regulation (EC) No 1272/2008:

Danger



Hazard statements:

Acute Tox. 4: H302+H312 - Harmful if swallowed or in contact with skin

Eye Dam. 1: H318 - Causes serious eye damage

Precautionary statements:

P264: Wash thoroughly after handling

P280: Wear protective gloves/protective clothing/eye protection/face protection

P302+P352: IF ON SKIN: Wash with plenty of water

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310: Immediately call a poison center/doctor

P501: Dispose of contents/container in accordance with regulations on hazardous waste or packaging and packaging waste respectively

2.3 Other hazards:

Product fails to meet PBT/vPvB criteria

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance:

Chemical description: Inorganic substance


Components:

- CONTINUED ON NEXT PAGE -



SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS (continued)

In accordance with Annex II of Regulation (EC) No 1907/2006 (point 3), the product contains:

Identification	Chemical name/Classification		Concentration
CAS: 6153-56-6 EC: 205-634-3 Index: 607-006-00-8 REACH: 01-2119534576-33-XXXX	Oxalic acid· 2H₂O	Self-classified	75 - <100 %
	Regulation 1272/2008	Acute Tox. 4: H302+H312; Eye Dam. 1: H318 - Danger 	

To obtain more information on the hazards of the substances consult sections 8, 11, 12, 15 and 16.

3.2 Mixture:

Non-applicable

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures:

The symptoms resulting from intoxication can appear after exposure, therefore, in case of doubt, seek medical attention for direct exposure to the chemical product or persistent discomfort, showing the SDS of this product.

By inhalation:

This product does not contain substances classified as hazardous for inhalation, however, in case of symptoms of intoxication remove the person affected from the exposure area and provide with fresh air. Seek medical attention if the symptoms get worse or persist.

By skin contact:

Remove contaminated clothing and footwear, rinse skin or shower the person affected if appropriate with plenty of cold water and neutral soap. In serious cases see a doctor. If the product causes burns or freezing, clothing should not be removed as this could worsen the injury caused if it is stuck to the skin. If blisters form on the skin, these should never be burst as this will increase the risk of infection.

By eye contact:

Rinse eyes thoroughly with lukewarm water for at least 15 minutes. Do not allow the person affected to rub or close their eyes. If the injured person uses contact lenses, these should be removed unless they are stuck to the eyes, in which case this could cause further damage. In all cases, after cleaning, a doctor should be consulted as quickly as possible with the SDS of the product.

By ingestion/aspiration:

Request medical assistance immediately, showing the SDS of this product. Do not induce vomiting, but if it does happen keep the head down to avoid aspiration. In the case of loss of consciousness do not administer anything orally unless supervised by a doctor. Rinse out the mouth and throat, as they may have been affected during ingestion. Keep the person affected at rest.

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

Acute and delayed effects are indicated in sections 2 and 11.

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

Non-applicable

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media:

Product is non-flammable under normal conditions of storage, handling and use. In the case of combustion as a result of improper handling, storage or use preferably use polyvalent powder extinguishers (ABC powder), in accordance with the Regulation on fire protection systems. IT IS NOT RECOMMENDED to use tap water as an extinguishing agent.

5.2 Special hazards arising from the substance or mixture:

As a result of combustion or thermal decomposition reactive sub-products are created that can become highly toxic and, consequently, can present a serious health risk.

5.3 Advice for firefighters:

Depending on the magnitude of the fire it may be necessary to use full protective clothing and self-contained breathing apparatus (SCBA). Minimum emergency facilities and equipment should be available (fire blankets, portable first aid kit,...) in accordance with Directive 89/654/EC.

Additional provisions:

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SECTION 5: FIREFIGHTING MEASURES (continued)

Act in accordance with the Internal Emergency Plan and the Information Sheets on actions to take after an accident or other emergencies. Eliminate all sources of ignition. In case of fire, cool the storage containers and tanks for products susceptible to combustion, explosion or BLEVE as a result of high temperatures. Avoid spillage of the products used to extinguish the fire into an aqueous medium.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

Sweep up and shovel product or collect by other means and place in container for reuse (preferred) or disposal

6.2 Environmental precautions:

This product is not classified as hazardous to the environment. Keep product away from drains, surface and ground water.

6.3 Methods and material for containment and cleaning up:

It is recommended:

Sweep up and shovel product or collect by other means and place in container for reuse (preferred) or disposal

6.4 Reference to other sections:

See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

A.- Precautions for safe manipulation

Comply with the current legislation concerning the prevention of industrial risks. Keep containers hermetically sealed. Control spills and residues, destroying them with safe methods (section 6). Avoid leakages from the container. Maintain order and cleanliness where dangerous products are used.

B.- Technical recommendations for the prevention of fires and explosions

Due to its non-flammable nature, the product does not present a fire risk under normal conditions of storage, handling and use.

C.- Technical recommendations to prevent ergonomic and toxicological risks

Do not eat or drink during the process, washing hands afterwards with suitable cleaning products.

D.- Technical recommendations to prevent environmental risks

It is recommended to have absorbent material available at close proximity to the product (See subsection 6.3)

7.2 Conditions for safe storage, including any incompatibilities:

A.- Technical measures for storage

Minimum Temp.: 5 °C

Maximum Temp.: 50 °C

Maximum time: 12 Months

B.- General conditions for storage

Avoid sources of heat, radiation, static electricity and contact with food. For additional information see subsection 10.5

7.3 Specific end use(s):

Please see the annex for detailed information about handling, storage and specific end uses.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters:

Substances whose occupational exposure limits have to be monitored in the workplace

Nuisance dust: Inhalable dust 10 mg/m³ // Respirable dust 4 mg/m³

DNEL (Workers):



SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (continued)

Identification		Short exposure		Long exposure	
		Systemic	Local	Systemic	Local
Oxalic acid· 2H ₂ O CAS: 6153-56-6 EC: 205-634-3	Oral	Non-applicable	Non-applicable	Non-applicable	Non-applicable
	Dermal	Non-applicable	Non-applicable	2,29 mg/kg	Non-applicable
	Inhalation	Non-applicable	Non-applicable	4,03 mg/m ³	Non-applicable

DNEL (General population):

Identification		Short exposure		Long exposure	
		Systemic	Local	Systemic	Local
Oxalic acid· 2H ₂ O CAS: 6153-56-6 EC: 205-634-3	Oral	Non-applicable	Non-applicable	1,14 mg/kg	Non-applicable
	Dermal	Non-applicable	Non-applicable	1,14 mg/kg	Non-applicable
	Inhalation	Non-applicable	Non-applicable	Non-applicable	Non-applicable

PNEC:

Identification					
Oxalic acid· 2H ₂ O CAS: 6153-56-6 EC: 205-634-3	STP	1550 mg/L	Fresh water	0,1622 mg/L	
	Soil	Non-applicable	Marine water	Non-applicable	
	Intermittent	1,622 mg/L	Sediment (Fresh water)	Non-applicable	
	Oral	Non-applicable	Sediment (Marine water)	Non-applicable	



8.2 Exposure controls:

A.- General security and hygiene measures in the work place



As a preventative measure it is recommended to use basic Personal Protective Equipment, with the corresponding <<CE marking>> in accordance with Directive 89/686/EC. For more information on Personal Protective Equipment (storage, use, cleaning, maintenance, class of protection,...) consult the information leaflet provided by the manufacturer. For more information see subsection 7.1.

All information contained herein is a recommendation which needs some specification from the labour risk prevention services as it is not known whether the company has additional measures at its disposal.



B.- Respiratory protection

Pictogram	PPE	Labelling	CEN Standard	Remarks
 Compulsory use of face mask	Filter mask for particles	 CAT III	EN 149:2001+A1:2009	Replace when an increase in resistance to breathing is observed.



C.- Specific protection for the hands

Pictogram	PPE	Labelling	CEN Standard	Remarks
 Mandatory hand protection	NON-disposable chemical protective gloves	 CAT III	EN 374-1:2003 EN 374-3:2003/AC:2006 EN 420:2003+A1:2009	The Breakthrough Time indicated by the manufacturer must exceed the period during which the product is being used. Do not use protective creams after the product has come into contact with skin.

D.- Ocular and facial protection

Pictogram	PPE	Labelling	CEN Standard	Remarks
 Mandatory face protection	Face shield	 CAT II	EN 166:2001 EN 167:2001 EN 168:2001 EN ISO 4007:2012	Clean daily and disinfect periodically according to the manufacturer's instructions. Use if there is a risk of splashing.



E.- Body protection

Pictogram	PPE	Labelling	CEN Standard	Remarks
 Mandatory complete body protection	Disposable clothing for protection against chemical risks	 CAT III	EN 13034:2005+A1:2009 EN 168:2001 EN ISO 13982-1:2004/A1:2010 EN ISO 6529:2001 EN ISO 6530:2005 EN 464:1994	For professional use only. Clean periodically according to the manufacturer's instructions.



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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (continued)

Pictogram	PPE	Labelling	CEN Standard	Remarks
 Mandatory foot protection	Safety footwear for protection against chemical risk		EN ISO 20345:2011 EN 13832-1:2006	Replace boots at any sign of deterioration.

F.- Additional emergency measures

Emergency measure	Standards	Emergency measure	Standards
 Emergency shower	ANSI Z358-1 ISO 3864-1:2002	 Eyewash stations	DIN 12 899 ISO 3864-1:2002

Environmental exposure controls:

In accordance with the community legislation for the protection of the environment it is recommended to avoid environmental spillage of both the product and its container. For additional information see subsection 7.1.D

Volatile organic compounds:

With regard to Directive 2010/75/EU, this product has the following characteristics:

V.O.C. (Supply):	0 % weight
V.O.C. density at 20 °C:	0 kg/m ³ (0 g/L)
Average carbon number:	Non-applicable
Average molecular weight:	Non-applicable

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

For complete information see the product datasheet.

Appearance:

Physical state at 20 °C:	Solid
Appearance:	Powdery
Colour:	White
Odour:	Odourless
Odour threshold:	Non-applicable *

Volatility:

Boiling point at atmospheric pressure:	>160 °C
Vapour pressure at 20 °C:	Non-applicable *
Vapour pressure at 50 °C:	Non-applicable *
Evaporation rate at 20 °C:	Non-applicable *

Product description:

Density at 20 °C:	813 kg/m ³
Relative density at 20 °C:	0,813
Dynamic viscosity at 20 °C:	Non-applicable *
Kinematic viscosity at 20 °C:	Non-applicable *
Kinematic viscosity at 40 °C:	Non-applicable *
Concentration:	Non-applicable *
pH:	~0,7 at 6,15 %
Vapour density at 20 °C:	Non-applicable *
Partition coefficient n-octanol/water 20 °C:	Non-applicable *
Solubility in water at 20 °C:	108 kg/m ³

*Not relevant due to the nature of the product, not providing information property of its hazards.

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES (continued)

Solubility properties:	Highly water-soluble
Decomposition temperature:	Non-applicable *
Melting point/freezing point:	190 °C
Explosive properties:	Non-applicable *
Oxidising properties:	Non-applicable *

Flammability:

Flash Point:	Non-applicable
Flammability (solid, gas):	Non-applicable *
Autoignition temperature:	Non-applicable *
Lower flammability limit:	Non-applicable *
Upper flammability limit:	Non-applicable *

Explosive:

Lower explosive limit:	Non-applicable *
Upper explosive limit:	Non-applicable *

9.2 Other information:

Surface tension at 20 °C:	Non-applicable *
Refraction index:	Non-applicable *

*Not relevant due to the nature of the product, not providing information property of its hazards.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity:

No hazardous reactions are expected because the product is stable under recommended storage conditions. See section 7.

10.2 Chemical stability:

Chemically stable under the conditions of storage, handling and use.

10.3 Possibility of hazardous reactions:

Under the specified conditions, hazardous reactions that lead to excessive temperatures or pressure are not expected.

10.4 Conditions to avoid:

Applicable for handling and storage at room temperature:

Shock and friction	Contact with air	Increase in temperature	Sunlight	Humidity
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

10.5 Incompatible materials:

Acids	Water	Oxidising materials	Combustible materials	Others
Not applicable	Not applicable	Not applicable	Not applicable	Avoid alkalis or strong bases

10.6 Hazardous decomposition products:

See subsection 10.3, 10.4 and 10.5 to find out the specific decomposition products. Depending on the decomposition conditions, complex mixtures of chemical substances can be released: carbon dioxide (CO₂), carbon monoxide and other organic compounds.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

The experimental information related to the toxicological properties of the product itself is not available

Dangerous health implications:

In case of exposure that is repetitive, prolonged or at concentrations higher than the recommended occupational exposure limits, adverse effects on health may result, depending on the means of exposure:

A- Ingestion (acute effect):

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SECTION 11: TOXICOLOGICAL INFORMATION (continued)

- Acute toxicity : The consumption of a considerable dose can cause irritation in the throat, abdominal pain, nausea and vomiting.
- Corrosivity/Irritability: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.
- B- Inhalation (acute effect):
 - Acute toxicity : Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for inhalation. For more information see section 3.
 - Corrosivity/Irritability: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.
- C- Contact with the skin and the eyes (acute effect):
 - Contact with the skin: Above all, may have harmful effects for health if the product is absorbed through the skin. For more information on the secondary effects of skin contact see section 2.
 - Contact with the eyes: Produces serious eye damage after contact.
- D- CMR effects (carcinogenicity, mutagenicity and toxicity to reproduction):
 - Carcinogenicity: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for the effects mentioned. For more information see section 3.
 - IARC: Non-applicable
 - Mutagenicity: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.
 - Reproductive toxicity: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.
- E- Sensitizing effects:
 - Respiratory: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous with sensitising effects. For more information see section 3.
 - Cutaneous: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.
- F- Specific target organ toxicity (STOT) - single exposure:

Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.
- G- Specific target organ toxicity (STOT)-repeated exposure:
 - Specific target organ toxicity (STOT)-repeated exposure: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.
 - Skin: Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.
- H- Aspiration hazard:

Based on available data, the classification criteria are not met, as it does not contain substances classified as dangerous for this effect. For more information see section 3.

Other information:

Non-applicable

Specific toxicology information on the substances:

Identification	Acute toxicity		Genus
Oxalic acid· 2H ₂ O CAS: 6153-56-6 EC: 205-634-3	LD50 oral	500 mg/kg	Rat
	LD50 dermal	2000 mg/kg	Rabbit
	LC50 inhalation	>5 mg/L (4 h)	

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity:

Identification	Acute toxicity		Species	Genus
Oxalic acid· 2H ₂ O CAS: 6153-56-6 EC: 205-634-3	LC50	160 mg/L (48 h)	Leuciscus idus	Fish
	EC50	136.9 mg/L (48 h)	Daphnia magna	Crustacean
	EC50	Non-applicable		

12.2 Persistence and degradability:

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SECTION 12: ECOLOGICAL INFORMATION (continued)

Identification	Degradability		Biodegradability	
Oxalic acid· 2H ₂ O CAS: 6153-56-6 EC: 205-634-3	BOD ₅	Non-applicable	Concentration	100 mg/L
	COD	Non-applicable	Period	14 days
	BOD ₅ /COD	0.89	% Biodegradable	37 %

12.3 Bioaccumulative potential:

Identification	Bioaccumulation potential	
Oxalic acid· 2H ₂ O CAS: 6153-56-6 EC: 205-634-3	BCF	1
	Pow Log	-0.81
	Potential	Low

12.4 Mobility in soil:

Not available

12.5 Results of PBT and vPvB assessment:

Product fails to meet PBT/vPvB criteria

12.6 Other adverse effects:

Not described

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods:

Code	Description	Waste class (Regulation (EU) No 1357/2014)
16 03 03*	inorganic wastes containing hazardous substances	Dangerous

Type of waste (Regulation (EU) No 1357/2014):

HP4 Irritant — skin irritation and eye damage, HP6 Acute Toxicity

Waste management (disposal and evaluation):

Consult the authorized waste service manager on the assessment and disposal operations in accordance with Annex 1 and Annex 2 (Directive 2008/98/EC). As under 15 01 (2014/955/EC) of the code and in case the container has been in direct contact with the product, it will be processed the same way as the actual product. Otherwise, it will be processed as non-dangerous residue. We do not recommended disposal down the drain. See paragraph 6.2.

Regulations related to waste management:

In accordance with Annex II of Regulation (EC) No 1907/2006 (REACH) the community or state provisions related to waste management are stated

Community legislation: Directive 2008/98/EC, 2014/955/EU, Regulation (EU) No 1357/2014

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land:

With regard to ADR 2017 and RID 2017:

14.1 UN number:	Non-applicable
14.2 UN proper shipping name:	Non-applicable
14.3 Transport hazard class(es):	Non-applicable
Labels:	Non-applicable
14.4 Packing group:	Non-applicable
14.5 Environmental hazards:	No
14.6 Special precautions for user	
Special regulations:	Non-applicable
Tunnel restriction code:	Non-applicable
Physico-Chemical properties:	see section 9
Limited quantities:	Non-applicable
14.7 Transport in bulk according to Annex II of Marpol and the IBC Code:	Non-applicable

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SECTION 14: TRANSPORT INFORMATION (continued)

Transport of dangerous goods by sea:

With regard to IMDG 38-16:

- | | |
|---|----------------|
| 14.1 UN number: | Non-applicable |
| 14.2 UN proper shipping name: | Non-applicable |
| 14.3 Transport hazard class(es): | Non-applicable |
| Labels: | Non-applicable |
| 14.4 Packing group: | Non-applicable |
| 14.5 Environmental hazards: | No |
| 14.6 Special precautions for user | |
| Special regulations: | Non-applicable |
| EmS Codes: | |
| Physico-Chemical properties: | see section 9 |
| Limited quantities: | Non-applicable |
| Segregation group: | 1 |
| 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code: | Non-applicable |

Transport of dangerous goods by air:

With regard to IATA/ICAO 2018:

- | | |
|---|----------------|
| 14.1 UN number: | Non-applicable |
| 14.2 UN proper shipping name: | Non-applicable |
| 14.3 Transport hazard class(es): | Non-applicable |
| Labels: | Non-applicable |
| 14.4 Packing group: | Non-applicable |
| 14.5 Environmental hazards: | No |
| 14.6 Special precautions for user | |
| Physico-Chemical properties: | see section 9 |
| 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code: | Non-applicable |

SECTION 15: REGULATORY INFORMATION

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

Candidate substances for authorisation under the Regulation (EC) No 1907/2006 (REACH): Non-applicable

Substances included in Annex XIV of REACH ("Authorisation List") and sunset date: Non-applicable

Regulation (EC) No 1005/2009, about substances that deplete the ozone layer: Non-applicable

Article 95, REGULATION (EU) No 528/2012: Non-applicable

REGULATION (EU) No 649/2012, in relation to the import and export of hazardous chemical products: Non-applicable

Seveso III:

Non-applicable

Limitations to commercialisation and the use of certain dangerous substances and mixtures (Annex XVII REACH, etc):

Non-applicable

Specific provisions in terms of protecting people or the environment:

It is recommended to use the information included in this safety data sheet as a basis for conducting workplace-specific risk assessments in order to establish the necessary risk prevention measures for the handling, use, storage and disposal of this product.

Other legislation:

The product could be affected by sectorial legislation

HACCP: Hazard analysis and critical control points, ISO: 22000

15.2 Chemical safety assessment:

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SECTION 15: REGULATORY INFORMATION (continued)

The provider has carried out a chemical safety assessment

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with ANNEX II-Guide to the compilation of safety data sheets of Regulation (EC) No 1907/2006 (Regulation (EC) No 2015/830)

Modifications related to the previous Safety Data Sheet which concerns the ways of managing risks.:

Non-applicable

Texts of the legislative phrases mentioned in section 2:

H302+H312: Harmful if swallowed or in contact with skin

H318: Causes serious eye damage

Texts of the legislative phrases mentioned in section 3:

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3

CLP Regulation (EC) No 1272/2008:

Acute Tox. 4: H302+H312 - Harmful if swallowed or in contact with skin

Eye Dam. 1: H318 - Causes serious eye damage

Advice related to training:

Minimal training is recommended in order to prevent industrial risks for staff using this product and to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources:

<http://echa.europa.eu>

<http://eur-lex.europa.eu>

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road

IMDG: International maritime dangerous goods code

IATA: International Air Transport Association

ICAO: International Civil Aviation Organisation

COD: Chemical Oxygen Demand

BOD5: 5-day biochemical oxygen demand

BCF: Bioconcentration factor

LD50: Lethal Dose 50

LC50: Lethal Concentration 50

EC50: Effective concentration 50

Log-POW: Octanol-water partition coefficient

Koc: Partition coefficient of organic carbon



ANNEX: EXPOSURE SCENARIO

OXALIC ACID EXPOSURE SCENARIOS

1. Industrial uses of aqueous solutions of oxalic acid

1.1. Exposure scenario

1. Title		
Short title	Industrial use of aqueous solutions of oxalic acid	
ES number	1	
Systematic title based on descriptive use	SU3, SU5 SU6a, SU6b SU8, SU9, SU10, SU13, SU14, SU16, SU17, SU18, SU19, SU20, SU23, SU0 PC0, PC7, PC9, PC10, PC14, PC 15, PC19, PC20, PC21, PC23, PC32, PC35, PC36, PC37, PC34 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b	
Processes, tasks and activities covered	The Processes, tasks and activities covered are described in Section 2.	
Evaluation Method	Environmental, inhalation and dermal exposure assessments are based on ECETOC TRA.	
2. Operating conditions and risk management measures		
PROC	Definition according to REACH	Tasks involved
PROC1	Use in closed processes, with no probability of exposure. Industrial environment.	More information in the ECHA Guide on the information requirements
PROC2	Use in closed and continuous processes with occasional controlled exposure (e.g. sampling). Industrial environment.	
PROC3	Use in closed batch processes (synthesis or preparation). Industrial environment.	Chapter R.12: Descriptive use system (ECHA-2010-G-05-EN, 26/03/2010).
PROC4	Use in batch and other processes (synthesis) where there is a possibility of exposure. Industrial environment.	
PROC5	Mixes or unions in batch processes for formulations of preparations and articles (in multi-stages and/or with significant contact). Industrial environment.	
PROC7	Spraying in industrial applications and environments. Industrial environment.	
PROC8a	Transfer of substances or preparations (loading/unloading) from/to warehouses/large containers in inappropriate facilities.	
PROC8b	Transfer of substances or preparations (loading/unloading) from/to ships/large containers in appropriate facilities.	
PROC9	Transfer of substances or preparations to small containers (packaging lines, including weighing). Industrial environment.	
PROC10	Application by roller or brush/brush with adhesive or other coating. Industrial and non-industrial environment.	
PROC13	Treatment of articles by bath and pouring. Industrial or non-industrial environment.	
PROC15	Use of laboratory reagent. Non-industrial environment	
ERC 1-6b	Manufacturing, formulation and all types of industrial uses	
2.1 Control of workers exposure		
Product Characteristics		
	Use in mixtures	Content in mixtures
		Possibility of emission

- CONTINUED ON NEXT PAGE -

OXALIC ACID



ANNEX: EXPOSURE SCENARIO (continued)

PROC	USE IN MEASURES	CONCENTRATION IN MEASURES	POSSIBILITY OF EMISSION
PROC 7	Not excluded	> 25 % w/w (non-restrictive)	Medium
Other applicable PROCs	Not excluded	> 25 % w/w (non-restrictive)	Low

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ANNEX: EXPOSURE SCENARIO (continued)

Quantity used

The actual tonnage handled per shift is not considered an influence on the exposure as such for this scenario. On the other hand, the combination of the scale of operation (industrial vs. professional) and the level of automation (as reflected in the PROC) are the main determinants of the intrinsic process of potential emission.

Frequency and duration of use/exposure

All applicable PROCs	> 4 hours (unrestricted)
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Technical measures and conditions at process (source) level to prevent emission

Process level risk management measures (e.g. containment or segregation of emission source) are generally not required.

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

PROC	Separation level	Localized Controls (LC)	LC Efficiency (according to ECTOC TRA)	More information
All applicable PROCs	Processes generally do not require separation of workers, unless a specific stage of the process is carried out with a duration less than one full shift. If this is the case, you must ensure that the worker is separated from the emission source for the rest of the shift.	Extractive Local Ventilation (LEV) (The use of LEV is not mandatory for PROC1, PROC2 and PROC3, but it is recommended)	N/A	

Organisational measures to prevent and limit emissions, dispersion and exposure

Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good cleaning and personal care practices (regular cleaning with appropriate devices), no eating or smoking in the workplace, use of standard work clothing unless otherwise indicated. Shower and change clothes at the end of the work shift. Do not wear contaminated clothing at home. Do not remove dust with compressed air.

Measures and conditions relating to personal protection, hygiene and health assessment

PROC	Specification of EPR and efficiency	Glove Specifications	Protective clothing - Eye protection specification This is the first publication	Additional PPE.
PROC 7	Use of respiratory protection with a minimum efficiency of 90%.	Wear appropriate gloves (nitrile, neoprene, natural rubber, polyvinyl chloride, natural rubber: Breakthrough> 360 permeability). Protective clothing.	Since oxalic acid is irritating to the eyes, the use of a face shield or eye protection is a good idea. prerequisite for all stages of the process.	Standard work clothes.
All applicable PROCs	Not required			

2.2 Environmental exposure control

Quantity used

The daily and annual amount per centre is not considered to be the main determinant for environmental exposure.

Frequency and duration of use

- CONTINUED ON NEXT PAGE -



ANNEX: EXPOSURE SCENARIO (continued)

Intermittent (<12 times per year) or continuous use and emission.

Technical measures and conditions of installations to reduce or limit discharges, emissions into the atmosphere and emissions into the soil.

Risk management measures related to the environmental purpose to prevent discharges of oxalic acid solutions into municipal waste water or surface water, where such discharges are expected to cause significant changes in pH. Regular monitoring of the pH during its introduction into open waters is necessary. In general, discharges should be made in such a way that pH changes in the receiving surface water are minimised (e.g. through neutralisation).

Measures and conditions relating to waste

Industrial solid oxalic acid waste should be reused or discharged into industrial wastewater and neutralized if necessary.

3. Estimation of exposure and reference to its source

Occupational exposure

ECTOCT TRA was used for inhalation and dermal exposure assessment. The risk characterisation rate (RCR) for inhalation exposure is based on the inhalation DNEL for oxalic acid of 2,29 mg.kg⁻¹ day⁻¹. The risk characterization rate (RCR) for dermal exposure is based on the dermal DNEL for oxalic acid 4.03 mg.kg⁻¹ day⁻¹.

PROC	Method used for inhalation exposure assessment	Estimated inhalation exposure mg/m ³ (RCR)	Method used for the evaluation of the dermal exposure	Estimated dermal exposure mg/kg/day (RCR)
PROC1	ECTOCT TRA	0.038 (0.002)	ECTOCT TRA	0.034 (0.009)
PROC2	ECTOCT TRA	0.375 (0.023)	ECTOCT TRA	0.137 (0.034)
PROC3	ECTOCT TRA	1.125 (0.070)	ECTOCT TRA	0.034 (0.009)
PROC4	ECTOCT TRA	1.876 (0.117)	ECTOCT TRA	0.686 (0.170)
PROC5	ECTOCT TRA	1.876 (0.117)	ECTOCT TRA	0.069 (0.017)
PROC7	ECTOCT TRA	1.876 (0.117)	ECTOCT TRA	2.143 (0.532)
PROC8a	ECTOCT TRA	3.751 (0.234)	ECTOCT TRA	0.137 (0.034)
PROC8b	ECTOCT TRA	0.563 (0.035)	ECTOCT TRA	0.686 (0.170)
PROC9	ECTOCT TRA	1.876 (0.117)	ECTOCT TRA	0.686 (0.170)
PROC10	ECTOCT TRA	3.751 (0.234)	ECTOCT TRA	1.371 (0.340)
PROC13	ECTOCT TRA	3.751 (0.234)	ECTOCT TRA	0.686 (0.170)
PROC15	ECTOCT TRA	1.876 (0.117)	ECTOCT TRA	0.034 (0.085)

Environmental exposure

Environmental exposure assessment is only relevant to the aquatic environment, where applicable including STPs/WWTPs, because oxalic acid emissions at different stages of the life cycle (production and use) are mainly applied (wastes) to water. The aquatic effect and risk assessment deals only with the effect that may be caused by possible changes in pH related to discharges of H⁺ into organisms and ecosystems, the toxicity being expected to be of oxalic acid is negligible compared to the (potential) effect of pH. The topic is only addressed at the local level, including municipal wastewater treatment plants (STPs) or industrial wastewater treatment plants (WWTPs) where applicable, for both production and industrial use and any expected effects that might occur at the local scale.

The high water solubility and low vapour pressure indicate that oxalic acid is predominantly found in water. Due to the low vapour pressure no significant emissions or air exposure are expected. For this exposure scenario, no emissions or exposure to the terrestrial environment are expected either.

The production of oxalic acid can result in the emission of wastewater and can locally increase the

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ANNEX: EXPOSURE SCENARIO (continued)

Emissions to the environment	concentration of oxalic acid and affect the pH in the aquatic environment. When the pH is not neutralised, the discharge of effluents from oxalic acid producing plants can affect the pH of the receiving waters. Normally, the pH of effluents is measured with a lot of accuracy.frequency and can easily be neutralised with the frequency required by national legislation.						
Concentration of exposure in wastewater treatment plants (WWTP) (RCR in STP)	ERC1 (RCR)	ERC2 (RCR)	ERC3 (RCR)	ERC4 (RCR)	ERC5 (RCR)	ERC6a (RCR)	ERC6b (RCR)
	0.024	0.001	0.08	0.10	0.10	0.016	0.01
Concentration of exposure in aquatic pelagic compartments	When oxalic acid is emitted to the water surface, the absorption of particles and sediments will be negligible. When oxalic acid is expelled to the surface of the water, the pH may decrease, depending on the buffering capacity of the water. The higher the water's buffering capacity, the lower the effect on pH.						
Concentration of exposure in sediments	Sediment compartments are not included in this ES because it is not considered relevant. for oxalic acid: when oxalic acid is emitted to the aquatic space, the absorption of sediment particles is negligible.						
Exposure concentrations in groundwater and soil	The terrestrial compartment is not included in this exposure scenario because it is not considered relevant.						
Concentration of exposure in the atmospheric space	The air compartment is not included in this CSA as it is not considered relevant for oxalic acid.						
Concentration of exposure relevant to the food chain (secondary poisoning)	Bioaccumulation in organisms is not relevant for oxalic acid: therefore no risk assessment for secondary poisoning is required.						

4. DU Guide to assess if you work within the limits set by the ES

Occupational

The DU works within the limits established by the ES, in cases where the risk management measures described above are complied with or where the downstream user can demonstrate for himself that his operating conditions and the risk management measures implemented are adequate. This is done by showing that dermal and inhalation exposure is limited to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) indicated below. If measurement data are not available, the DU may use an appropriate scale tool, such as ECTOC TRA ([www.ecetoc.org / tra](http://www.ecetoc.org/tra)) to estimate the associated exposure. DNELinhalation for oxalic acid of 2.29 mg / (kg.day). DNELdermal for oxalic acid 4.03 mg / (kg.day)

Environmental

If a facility does not meet the conditions stipulated in the safe use of ES, it is recommended that a step-by-step approach be applied to conduct a more specific assessment at the facility.



ANNEX: EXPOSURE SCENARIO (continued)

1. Industrial uses of solid oxalic acid

1.1. Exposure Scenario

1. Title		
Abbreviated title	Industrial use of solid oxalic acid	
Numero ES	2	
Systematic title based on descriptive use	SU3, SU5, SU6a, SU6b SU8, SU9, SU10, SU13, SU14, SU16, SU17, SU18, SU19, SU20, SU23, SU0 PC0, PC7, PC9, PC10, PC14, PC 15, PC19, PC20, PC21, PC23, PC32, PC35, PC36, PC37, PC34 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b	
Processes, tasks and covered activities	The processes, tasks and activities covered are described in Section 2.	
Evaluation method	Environmental, inhalation and dermal exposure assessments are based on ECETOC TRA.	
2. Operating conditions and risk management measures		
PROC	Definition according to REACH	Tasks involved
PROC1	Use in closed processes, no likelihood of exposure	More information in the ECHA Guide on the information requirements and chemical safety assessment, Chapter R.12: Descriptive use system (ECHHA-2010-G-05-EN, 26/03/2010).
PROC2	Industrial environment.	
PROC3	Use in closed and continuous processes with occasional controlled exposure.	
PROC4	(e.g. sampling). Industrial environment.	
PROC5	Use in closed batch processes (synthesis or preparation).	
PROC7	Industrial environment.)	
PROC8a	Use in batch and other processes (synthesis) where there is a possibility of exposure.	
PROC8b	Industrial environment.	
PROC9	Mixtures or unions in batch processes for formulations of preparations and articles (in multi-stages and/or with significant contact).	
PROC10	Industrial environment.	
PROC13	Spraying in industrial applications and environments.	
PROC14	Industrial environment.	
PROC15	Transfer of substances or preparations (loading/unloading) from/to warehouses/large.	
PROC21	containers in inappropriate facilities.	
PROC22	Transfer of substances or preparations (loading/unloading) from/to ships/large containers in appropriate facilities.	
ERC 1-6b	Transfer of substances or preparations to small containers (packaging lines, including weighing).	

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ANNEX: EXPOSURE SCENARIO (continued)

2.1 Control of workers exposure

Product Characteristics

PROC	Use in mixtures	Content in mixtures	Possibility of emission
All applicable PROCs	Not excluded	(non-restrictive)	Medium

Quantity used

The actual tonnage handled per shift is not considered an influence on the exposure as such for this scenario. On the other hand, the combination of the scale of operation (industrial vs. professional) and the level of automation (as reflected in the PROC) are the main determinants of the intrinsic process of potential emission.

Frequency and duration of use or exposure

All applicable PROCs	> 4 hours (no restriction)
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Technical measures and conditions at process (source) level to prevent emission

Process level risk management measures (e.g. containment or segregation of emission source) are generally not required.

Technical measures and conditions to control dispersion from source to worker

PROC	Separation level	Localized Controls (LC)	LC Efficiency (according to ECTOC TRA)	More information
All applicable PROCs	Processes generally do not require separation of workers, unless a specific stage of the process is carried out with a duration of less than one full shift. If this is the case, it must be ensured that the worker is separated from the emission source for the remainder of the shift.	Extractive local ventilation (LEV) (The use of LEV is not mandatory for PROC1, PROC2 and PROC3, but it is recommended)	N/A	--

Organisational measures to prevent and limit emissions, dispersion and exposure

Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good cleaning and personal care practices (regular cleaning with appropriate devices), no eating or smoking in the workplace, use of standard work clothing unless otherwise indicated. Shower and change clothes at the end of the work shift. Do not wear contaminated clothing at home. Do not remove dust with compressed air.

Measures and conditions relating to personal protection, hygiene and health assessment

PROC	Specification and efficiency of the RPE	Glove Specifications	Eye protection specification	Additional PPE.
All applicable PROCs	Not required	Wear appropriate gloves (nitrile, neoprene, natural rubber, polyvinyl chloride, natural rubber: Breakthrough > 360 permeability). Protective clothing...	Since oxalic acid is irritating to the eyes, the use of a face shield or eye protection is a prerequisite for all stages of the process.	Standard work clothes.

2.2 Environmental exposure control

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ANNEX: EXPOSURE SCENARIO (continued)

2.2 Environmental exposure control

The daily and annual amount per centre is not considered to be the main determinant for environmental exposure.

Frequency and duration of use

Intermittent (<12 times per year) or continuous use and emission.

Technical measures and conditions for installations to reduce or limit discharges, emissions into the air and emissions into the soil

Risk management measures related to the environmental purpose to prevent discharges of oxalic acid solutions into municipal waste water or surface water, where such discharges are expected to cause significant changes in pH. Regular monitoring of the pH during its introduction into open waters is necessary. In general, discharges should be made in such a way that pH changes in the receiving surface water are minimised (e.g. through neutralisation).

Measures and conditions relating to waste

Oxalic acid industrial solid waste should be reused or discharged into industrial wastewater and neutralized if necessary.

3. Estimation of exposure and reference to its source

Occupational exposure

ECTOC TRA was used for inhalation and dermal exposure assessment. The risk characterisation rate (RCR) for inhalation exposure is based on the inhalation DNEL for oxalic acid of 2,29 mg.kg-1 day-1. The risk characterization rate (RCR) for dermal exposure is based on the dermal DNEL for oxalic acid 4.03 mg.kg-1 day-1

PROC	Method used for inhalation exposure assessment	Estimated inhalation exposure mg/m3 (RCR)	Method used for the evaluation of the dermal exposure	Estimated dermal exposure mg/kg/day (RCR)
PROC1	ECTOC TRA	0.010 (0.001)	ECTOC TRA	0.034 (0.009)
PROC2	ECTOC TRA	0.100 (0.006)	ECTOC TRA	0.137 (0.034)
PROC3	ECTOC TRA	0.100 (0.006)	ECTOC TRA	0.034 (0.009)
PROC4	ECTOC TRA	2.500 (0.156)	ECTOC TRA	0.686 (0.170)
PROC5	ECTOC TRA	2.500 (0.156)	ECTOC TRA	0.069 (0.017)
PROC7	ECTOC TRA	5.000 (0.312)	ECTOC TRA	2.143 (0.532)
PROC8a	ECTOC TRA	5.000 (0.312)	ECTOC TRA	0.137 (0.034)
PROC8b	ECTOC TRA	1.250 (0.078)	ECTOC TRA	0.686 (0.170)
PROC9	ECTOC TRA	2.000 (0.125)	ECTOC TRA	0.686 (0.170)
PROC10	ECTOC TRA	1.000 (0.062)	ECTOC TRA	1.371 (0.340)
PROC13	ECTOC TRA	0.500 (0.031)	ECTOC TRA	0.686 (0.170)
PROC 14	ECTOC TRA	1.000 (0.062)	ECTOC TRA	0.343 (0.085)
PROC15	ECTOC TRA	0.500 (0.031)	ECTOC TRA	0.034 (0.009)
PROC21	ECTOC TRA	1.000 (0.062)	ECTOC TRA	0.283 (0.070)
PROC 22	ECTOC TRA	0.100 (0.006)	ECTOC TRA	0.849 (0.211)

Environmental exposure

Environmental exposure assessment is only relevant to the aquatic environment, where applicable including STPs/WWTPs, because oxalic acid emissions at different stages of the life cycle (production and use) are mainly applied (wastes) to water. The aquatic effect and the risk assessment deals only with the effect that may be caused by possible changes in pH related to discharges of H+ into organisms and ecosystems, and the toxicity of oxalic acid is expected to be negligible compared to the (potential) effect of pH. The topic is only addressed at the local level, including municipal wastewater treatment plants (STPs) or industrial wastewater treatment plants (WWTPs) where applicable, for both production and industrial use and any expected effects that might occur at the local scale.

The high water solubility and low vapour pressure indicate that oxalic acid is predominantly found in water. Due to the low vapour pressure no significant emissions or air exposure are expected. For this exposure scenario, no emissions or exposure to the terrestrial environment are expected either.

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ANNEX: EXPOSURE SCENARIO (continued)

Emissions to the environment	The production of oxalic acid can result in the emission of wastewater and can locally increase the concentration of oxalic acid and affect the pH in the aquatic environment. When the pH is not neutralised, the discharge of effluents from oxalic acid producing plants can affect the pH of the receiving waters. The pH of effluents is normally measured very frequently and can easily be neutralised with the frequency required by national legislation.						
Concentration of exposure in wastewater treatment plants	ERC1 (RCR)	ERC2 (RCR)	ERC3 (RCR)	ERC4 (RCR)	ERC5 (RCR)	ERC6a (RCR)	ERC6b (RCR)
	0.024	0.001	0.0001	0.10	0.10	0.016	0.01
(WWTP) (RCR in STP)							
Concentration of exposure in aquatic pelagic compartments	When oxalic acid is emitted to the water surface, the absorption of particles and sediments will be negligible. When oxalic acid is expelled to the surface of the water, the pH may decrease, depending on the buffering capacity of the water. The higher the buffering capacity of the water, the lower the effect on the pH.						
Concentration of exposure in sediments	Sediment compartments are not included in this ES because it is not considered relevant for oxalic acid: when oxalic acid is emitted to the aquatic space, the absorption of sediment particles is negligible.						
Exposure concentrations in groundwater and soil	The terrestrial compartment is not included in this exposure scenario because it is not considered relevant.						
Concentration of exposure in the atmospheric space	The air compartment is not included in this CSA as it is not considered relevant for oxalic acid.						
Concentration of exposure relevant to the food chain (secondary poisoning)	Bioaccumulation in organisms is not relevant for oxalic acid: therefore no risk assessment for secondary poisoning is required.						

4. DU Guide to assess if you work within the limits set by the ES

Occupational

The DU works within the limits established by the ES, in cases where the risk management measures described above are complied with or where the downstream user can demonstrate for himself that his operating conditions and the risk management measures implemented are adequate. This is done by demonstrating that dermal and inhalation exposure is limited to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) indicated below. If measurement data are not available, the DU may use an appropriate scale tool, such as ECTOC TRA ([www.ecetoc.org / tra](http://www.ecetoc.org/tra)) to estimate the associated exposure.

Inhalation DNEL for oxalic acid of 2.29 mg / (kg.day). Dermal

DNEL for oxalic acid 4.03 mg / (kg.day)

Environmental

If a facility does not meet the conditions stipulated in the safe use of ES, it is recommended that a step-by-step approach be applied to conduct a more specific assessment at the facility.



ANNEX: EXPOSURE SCENARIO (continued)

1. Professional use of oxalic acid

1.1. Exposure scenario

1. Title	
Short title	Professional use of aqueous solutions of oxalic acid.
ES Number	3
Systematic title based on descriptive use	SU22, SU6a, SU18 PC9a, PC14, PC15, PC25, PC35, PC31 PROC10, PROC11, PROC15, PROC21 ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f
Tasks, processes and activities covered	The processes, tasks and activities covered are described in Section 2
Evaluation method	Environmental, inhalation and dermal exposure assessments are based on ECETOC TRA.

2. Operating conditions and risk management measures		
PROC	Definition according to REACH	Tasks involved
PROC10	Application by roller or brush/brush with adhesive or other coating. Industrial and non-industrial environment.	More information in the ECHA Guide on the information requirements and chemical safety assessment, Chapter R.12: Usage System descriptor (ECHA-2010-G-05-EN, 26/03/2010).
PROC11	Spraying outside the environment or application industrial	
PROC15	Use of laboratory reagent. Non-industrial environment.	
PROC21	Manipulation of low energy substances linked to materials and/or articles.	
ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f	Indoor and outdoor use of reactive substances or processing aids in open systems	

2.1 Control of workers exposure			
Product Characteristics			
PROC	Use in mixtures	Content in mixtures	Possibility of emission
PROC10, PROC11	Not excluded	>25% w/w (non-restrictive)	High
Other applicable PROCs	Not excluded	>25% w/w (non-restrictive)	Low

Quantity used

The actual tonnage handled per shift is not considered an influence on the exposure as such for this scenario. On the other hand, the combination of the scale of operation (industrial vs. professional) and the level of automation (as reflected in the PROC) are the main determinants of the intrinsic process of potential emission.

Frequency and duration of use or exposure

All applicable PROCs	> 4 hours(non-restrictive)
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Technical measures and conditions at process (source) level to prevent emission

Process level risk management measures (e.g. containment or segregation of emission source) are generally not required.

Technical measures and conditions to control dispersion from source to worker				
PROC	Separation level	Localized	LC Efficiency	More information

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ANNEX: EXPOSURE SCENARIO (continued)

		control (LC)	(according to ECTOC TRA)	
All applicable PROCs	Processes generally do not require separation of workers, unless a specific stage of the process is carried out with a duration of less than one full shift. If this is the case, it must be ensured that the worker is separated from the emission source for the rest of the shift.	Extractive local ventilation (LEV)	N/A	--

Organisational measures to prevent and limit emissions, dispersion and exposure

Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good cleaning and personal care practices (regular cleaning with appropriate devices), no eating or smoking in the workplace, use of standard work clothing unless otherwise indicated. Shower and change clothes at the end of the work shift. Do not wear contaminated clothing at home. Do not remove dust with compressed air.

Measures and conditions relating to personal protection, hygiene and health assessment

PROC	Specification and efficiency of the RPE	Glove Specifications	Especificación de protección para los ojos.	PPE adicional
PROC10, PROC11	Use of respiratory protection with a minimum of 90% of efficiency.	Wear appropriate gloves (nitrile, neoprene, natural rubber, polyvinyl chloride, natural rubber: Breakthrough > 360 permeability).	Dado que el ácido oxálico es irritante para los ojos, el uso de protector facial o protección ocular es un requisito previo para todas las etapas del proceso. Protective clothing	Standard work clothes.
Other applicable PROCs	Not required			

2.2 Environmental exposure control

Cantidad utilizada

1.000 kg/day

Frequency and duration of use

Intermittent (<12 times per year) or continuous use and emission.

Technical measures and conditions for installations to reduce or limit discharges, emissions into the air and emissions into the soil

Risk management measures related to the environmental purpose to avoid discharges of oxalic acid solutions into municipal wastewater or surface water.

Measures and conditions relating to waste

Oxalic acid residues should not be disposed of in household waste. The product must not be allowed to enter the sewer system.

3. Estimation of exposure and reference to its source

Occupational exposure

ECTOC TRA was used for inhalation and dermal exposure assessment. The risk characterisation rate (RCR) for inhalation exposure is based on the inhalation DNEL for oxalic acid of 2,29 mg.kg⁻¹ day⁻¹. The risk characterization rate (RCR) for dermal exposure is based on the dermal DNEL for oxalic acid 4.03 mg.kg⁻¹ day⁻¹

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ANNEX: EXPOSURE SCENARIO (continued)

PROC	Method used for inhalation exposure assessment	Estimated inhalation exposure mg/m ³ (RCR)	Method used for dermal exposure assessment	Estimated dermal exposure mg/Kg./día (RCR)
PROC10	ECTOC TRA	1.876 (0.117)	ECTOC TRA	1.371 (0.340)

PROC11	ECTOC TRA	7.503 (0.468)	ECTOC TRA	2.143 (0.532)
PROC15	ECTOC TRA	3.751 (0.234)	ECTOC TRA	0.034 (0.009)
PROC21	ECTOC TRA	Only for solids	ECTOC TRA	0.283 (0.070)

Environmental exposure

High water solubility and low vapor pressure indicate that oxalic acid is predominantly found in water. No significant emissions or exposure to the terrestrial environment are expected for this exposure scenario.

Emissions to the environment						
Concentration of exposure in local waters	ERC8a (RCR)	ERC8b (RCR)	ERC8c (RCR)	ERC8d (RCR)	ERC8e (RCR)	ERC8f (RCR)
	0.179	0.013	0.011	0.179	0.013	0.011
Concentration of exposure in aquatic pelagic compartments	When oxalic acid is emitted to the water surface, the absorption of particles and sediments will be negligible. When oxalic acid is expelled to the surface of the water, the pH may decrease, depending on the buffering capacity of the water. The higher the buffering capacity of the water, the lower the effect on the pH.					
Concentration of exposure in sediments	Sediment compartments are not included in this ES, because it is not considered relevant for oxalic acid: when oxalic acid is emitted to the aquatic space, the absorption of sediment particles is negligible.					
Concentration of exposure in groundwater and soil	The terrestrial compartment is not included in this exposure scenario because it is not considered relevant.					
Concentration of exposure in the atmospheric space	The atmospheric compartment is not this CSA, because it is not considered relevant.					
Concentration of exposure relevant to the food chain (secondary poisoning)	Bioaccumulation in organisms is not relevant for oxalic acid: therefore no risk assessment for secondary poisoning is required.					

4. DU Guide to assess if you work within the limits set by the ES

The DU works within the limits established by the ES, in cases where the risk management measures described above are complied with or where the downstream user can demonstrate for himself that his operating conditions and the risk management measures implemented are adequate. This is done by demonstrating that dermal and inhalation exposure is limited to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) indicated below. If measurement data are not available, the DU may use an appropriate scale tool, such as ECTOC TRA (www.ecetoc.org/tra) to estimate the associated exposure.

Inhalation DNEL for oxalic acid of 2.29 mg / (kg.day).

Dermal DNEL for oxalic acid 4.03 mg / (kg.day)

2. Professional use of solid oxalic acid

2.1. Exposure scenario

1. Title

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ANNEX: EXPOSURE SCENARIO (continued)

Abbreviated title	Profesional use of the oxalic acid
ES Number	4

Systematic title based on descriptive use	SU22, SU6a, SU18 PC9a, PC14, PC15, PC25, PC35, PC31 PROC10, PROC11, PROC15, PROC21 ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f
Tasks, processes and activities covered	The processes, tasks and activities covered are described in Section 2.
Evaluation method	Environmental, inhalation and dermal exposure assessments are based on ECETOC TRA.

2. Operating conditions and risk management measures

PROC	Definition according to REACH	Tasks involved
PROC10	Application by roller or brush/brush with adhesive or other coating. Industrial and non-industrial environment.	More information in the ECHA Guide on the information requirements and chemical safety assessment Chapter R.12 (ECHA-2010-G-05-EN, 26/03/2010).
PROC11	Spraying outside the environment or industrial application.	
PROC15	Use of laboratory reagent. Non-industrial environment.	
PROC21	Manipulation of low energy substances linked to materials and/or articles.	
ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f	Indoor and outdoor use of reactive substances or technological aids in systems open	

2.1 Control of workers exposure

Product Characteristics

PROC	Use in mixtures	Content in mixtures	Possibility of emission
All applicable PROCs	Not excluded	>25% w/w (non-restrictive)	Low

Quantity used

The actual tonnage handled per shift is not considered an influence on the exposure as such for this scenario. On the other hand, the combination of the scale of operation (industrial vs. professional) and the level of automation (as reflected in the PROC) are the main determinants of the intrinsic process of potential emission.

Frequency and duration of use or exposure

All applicable PROCs	> 4 hours (non-restrictive)
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Technical measures and conditions at process (source) level to prevent emission

Process level risk management measures (e.g. containment or segregation of emission source) are generally not required.

Technical measures and conditions to control dispersion from source to worker

PROC	Separation level	Localized Controls (LC)	LC Efficiency (according to ECETOC TRA)	More information
All applicable PROCs	Processes generally do not require separation of workers, unless a specific stage of the process is carried	Ventilación local extractiva	N/A	--

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ANNEX: EXPOSURE SCENARIO (continued)

out with a duration of less than one full shift. If this is the case, it must be ensured that the worker is separated from the emission source for the rest of the shift.

Organisational measures to prevent and limit emissions, dispersion and exposure

Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good cleaning and personal care practices (regular cleaning with appropriate devices), no eating or smoking in the workplace, use of standard work clothing unless otherwise indicated. Shower and change clothes at the end of the work shift. Do not wear contaminated clothing at home. Do not remove dust with compressed air.

Measures and conditions relating to personal protection, hygiene and health assessment

PROC	Specification of the RPE and efficiency	Glove Specifications	Eye Protection Specification	Additional PPE
All applicable PROCS	Not required	Wear appropriate gloves (nitrile, neoprene, natural rubber, polyvinyl chloride, natural rubber: Breakthrough > 360 permeability). Protective clothing	Since oxalic acid is irritating to the eyes, the use of a face shield or eye protection is a prerequisite for all stages of the process.	Standard work clothes.

2.2 Environmental exposure control

Quantity used

1.000 kg/day

Frequency and duration of use

Intermittent (<12 times per year) or continuous use and emission.

Technical measures and conditions of installations to reduce or limit discharges, emissions into the air and emissions into the soil.

Risk management measures related to the environmental purpose to avoid discharges of oxalic acid solutions into municipal wastewater or surface water.

Measures and conditions relating to waste

Oxalic acid residues should not be disposed of in household waste. The product must not be allowed to enter the sewer system.

3. Estimation of exposure and reference to its source

Occupational exposure

ECTOCT TRA was used for inhalation and dermal exposure assessment. The risk characterisation rate (RCR) for inhalation exposure is based on the inhalation DNEL for oxalic acid of 2,29 mg.kg⁻¹ day⁻¹. The risk characterization rate (RCR) for dermal exposure is based on the dermal DNEL for oxalic acid 4.03 mg.kg⁻¹ day⁻¹.

PROC	Method used for inhalation exposure assessment	Estimated inhalation exposure mg/m ³ (RCR)	Method used for dermal exposure assessment	Estimated dermal exposure mg/Kg/day (RCR)

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ANNEX: EXPOSURE SCENARIO (continued)

PROC10	ECTO TRA	0.100	(0.006)	ECTO TRA	1.371	(0.340)
PROC11	ECTO TRA	0.200	(0.012)	ECTO TRA	2.143	(0.532)
PROC15	ECTO TRA	0.020	(0.001)	ECTO TRA	0.034	(0.009)
PROC21	ECTO TRA	0.600	(0.037)	ECTO TRA	0.283	(0.070)

Environmental exposure

High water solubility and low vapor pressure indicate that oxalic acid is predominantly found in water. No significant emissions or exposure to the terrestrial environment are expected for this exposure scenario.

Emissions to the environment						
Concentration of exposure in local waters	ERC8a (RCR)	ERC8b (RCR)	ERC8c (RCR)	ERC8d (RCR)	ERC8e (RCR)	ERC8f (RCR)
	0.179	0.013	0.011	0.179	0.013	0.011
Concentration of exposure in aquatic pelagic compartments	When oxalic acid is emitted to the water surface, the absorption of particles and sediments will be negligible. When oxalic acid is expelled to the surface of the water, the pH may decrease, depending on the buffering capacity of the water. The higher the buffering capacity of the water, the lower the effect on the pH.					
Concentration of exposure in sediments	Sediment compartments are not included in this ES, because it is not considered relevant for oxalic acid: when oxalic acid is emitted to the aquatic space, the absorption of sediment particles is negligible.					
Concentration of exposure in groundwater and soil	The terrestrial compartment is not included in this exposure scenario because it is not considered relevant.					
Concentration of exposure in the atmospheric space	The atmospheric compartment is not included in this CSA because it is not considered relevant for oxalic acid.					
Concentration of exposure relevant to the food chain (secondary poisoning)	Bioaccumulation in organisms is not relevant for oxalic acid: therefore no risk assessment for secondary poisoning is required.					

4. DU Guide to assess if you work within the limits set by the ES

The DU works within the limits established by the ES, in cases where the risk management measures described above are complied with or where the downstream user can demonstrate for himself that his operating conditions and the risk management measures implemented are adequate. This is done by demonstrating that dermal and inhalation exposure is limited to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) indicated below. If measurement data are not available, the DU may use an appropriate scale tool, such as ECTOC TRA (www.ecetoc.org/tra) to estimate the associated exposure.

Inhalation DNEL for oxalic acid of 2.29 mg / (kg.day).

Dermal DNEL for oxalic acid 4.03 mg / (kg.day)

3. Uses of oxalic acid by the final consumer

3.1. Exposure scenario

1. Title

Abbreviated title	Consumer uses of preparations containing oxalic acid
ES number	5

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ANNEX: EXPOSURE SCENARIO (continued)

Systematic title based on the descriptive use	SU21 PC9a, PC35, PC31 PROC21 ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f
Tasks, processes and activities covered	The processes, tasks and activities covered are described in Section 2.
Evaluation method	Environmental, inhalation and dermal exposure assessments are based on ECETOC TRA.

2. Operating conditions and risk management measures

PROC	REACH definition	Involved tasks
PROC21	Low energy handling of substances linked to materials and/or articles.	More information in the ECHA Guide on the
ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f	Indoor and outdoor use of reactive substances or processing aids in open systems	information requirements and chemical safety assessment, Chapter R.12: Descriptive use system (ECHHA-2010-G-05-EN, 26/03/2010).

2.1 Exposure control

Product Characteristics

PROC	Use in mixtures	Content in mixtures	Possibility of emission
All applicable PROCs	Not excluded	>25% w/w (non-restrictive)	Low

Quantity used

The actual tonnage handled per shift is not considered an influence on the exposure as such for this scenario. On the other hand, the combination of the scale of operation (industrial vs. professional) and the level of automation (as reflected in the PROC) are the main determinants of the intrinsic process of potential emission.

Frequency and duration of use or exposure

All applicable PROCs	Non-restrictive
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Technical measures and conditions at process (source) level to prevent emission

For this consumer use there are usually no risk management measures required in the processes.

Conditions of use for consumers

PC	PC sub-category	Is the product sprayed?	Amount of product used per application (g)	Fraction by weight of the product ingredient
PC35	Cleaning and washing products (including solvent-based products)	No	10	<5%
PC9a	Paint removers, glue, wallpaper, sealants)	No	10	<5%

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ANNEX: EXPOSURE SCENARIO (continued)

PC31	Polishing products and waxes	No	10	<5%
Organisational measures to prevent and limit emissions, dispersion and exposure				
Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good cleaning and personal care practices (regular cleaning with appropriate devices), no eating or smoking in the workplace, use of standard work clothing unless otherwise indicated. Shower and change clothes at the end of the work shift. Do not wear contaminated clothing at home. Do not remove dust with compressed air.				
Measures and conditions relating to personal protection, hygiene and health assessment				
PROC	Specification of the RPE and efficiency	Glove Specifications	Eye Protection Specification	Additional PPE
All applicable PROCS	Not required	Not required Avoid skin contact	Not required Avoid contact with eyes	Not required

2.2 Environmental exposure control

Quantity used

10 g/application

Frequency and duration of use

Intermittent (< 12 times per year)

3. Estimation of exposure and reference to its source

Occupational exposure

ECTOCT TRA was used for inhalation and dermal exposure assessment. The risk characterisation rate (RCR) for inhalation exposure is based on the DNELdermic for consumers of oxalic acid of 1.14 mg.kg⁻¹ day⁻¹.

PROC	Method used for inhalation exposure assessment	Estimation of inhalation exposure mg/m ³ (RCR)	Method used for dermal exposure assessment	Estimación de la exposición cutánea mg/kg/day (RCR)
PC39	ECTOCT TRA	0.02	ECTOCT TRA	0.238 (0.20)
PC9a	ECTOCT TRA	0.02	ECTOCT TRA	0.238 (0.20)
PC31	ECTOCT TRA	0.02	ECTOCT TRA	0.238 (0.20)

Environmental exposure

High water solubility and low vapor pressure indicate that oxalic acid is predominantly found in water. No significant emissions or exposures to air are expected due to low vapor pressure. No significant emissions or exposures to the terrestrial environment are expected for this exposure scenario.

Environmental Emissions	
Concentration of exposure in sediments	The sediment compartment is not included in this ES because it is not considered relevant for oxalic acid: when oxalic acid is emitted for the aquatic compartment, the absorption of sediment particles is negligible.
Concentration of exposure in soil and groundwater	The terrestrial compartment is not included in this exposure scenario because it is not considered relevant.
Concentration of	The atmospheric compartment is not included in this CSA because it is not considered relevant for oxalic acid

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OXALIC ACID



ANNEX: EXPOSURE SCENARIO (continued)

exposure in the atmospheric space	
Concentration of exposure relevant to the food chain (secondary poisoning)	Bioaccumulation in organisms is not relevant for oxalic acid: therefore no risk assessment for secondary poisoning is required.

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation at European and state level, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product, it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within our awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

- END OF SAFETY DATA SHEET -

COMPANY INFORMATION DISTRIBUTOR

name	BRENNTAG N.V.	BRENNTAG Nederland B.V.
address	Nijverheidslaan 38 8540 Deerlijk	Donker Duyvisweg 44 3316 BM Dordrecht
country	Belgium	The Netherlands
phone number	+32 (0)56 77 69 44	+31 (0)78 65 44 944
fax number	+32 (0)56 77 57 11	+31 (0)78 65 44 919
website	www.brenntag.be	www.brenntag.nl
e-mail	info@brenntag.be	info@brenntag.nl
activities	Distribution and export of chemicals and raw materials	
VAT number	BE0405317567	NL001375945B01
recall procedure available	Yes	
emergency number (24/365)	+32 (0)56 77 69 44	+31 (0)78 6544 944
QUALITY SYSTEMS		
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ISO 14001	Yes	Yes
ISO 22000	Yes	Yes
FSSC 22000	Yes	Yes
GMP+ -feed	Yes	Yes
OHSAS18001	-	Yes
ESAD	Yes	Yes
other	-	AEO