

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

1.1. Product identifier

Product form	: Substance
Name	: Trizinc Dicitrate Dihydrate
Trade name	: ZINC CITRATE (Di- or TRIHYDRATE)
EC-No.	: 208-901-2
CAS-No.	: 5990-32-9
REACH registration No	: 01-2119461715-35-0002
Formula	: $Zn_3(C_6H_5O_7)_2 \cdot 2H_2O / Zn_3(C_6H_5O_7)_2 \cdot 3H_2O$

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

1.2.1. Relevant identified uses

Use of the substance/mixture	: Pharmaceutical industry Food-stuff industry Ink for offset printing
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1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Manufacturer

JOST CHEMICAL CO.
8150 Lackland
P.O. Box MO 63114
Saint Louis - USA
T +1 314-428-4300 - F +1 314-428-4366
sds@jostchemical.com

Distributor

JOST CHEMICAL EUROPE SPRL
Rue du Bois Portal 30/1-3
5300 Andenne - BELGIQUE
T +32 85 552 655 - F +32 85 552 654
info@josteurope.com

1.4. Emergency telephone number

Emergency number	: For Hazardous Materials [or Dangerous Goods] Incident Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night United States and Canada: 1-800-424-9300 / +1 703-527-3887 Global: +1 703-741-5970
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Eye Irrit. 2	H319
Aquatic Acute 1	H400
Aquatic Chronic 2	H411

Full text of hazard classes and H-statements : see section 16

Adverse physicochemical, human health and environmental effects

Causes serious eye irritation. Very toxic to aquatic life with long lasting effects. Not classified as flammable according to EC criteria, but may present a risk in the event of a fire.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



GHS07

GHS09

Signal word (CLP)

: Warning

Hazard statements (CLP)

: H319 - Causes serious eye irritation.
H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements (CLP)

: P273 - Avoid release to the environment.
P280 - Wear eye protection, face protection.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P391 - Collect spillage.
P501 - Dispose of contents/container to an approved waste disposal plant.

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2.3. Other hazards

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Trizinc Dicitrate Dihydrate	(CAS-No.) 5990-32-9 (EC-No.) 208-901-2 (REACH-no) 01-2119461715-35-0002	99 - 100	Eye Irrit. 2, H319 Aquatic Acute 1, H400 Aquatic Chronic 2, H411

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation	: Move the affected person away from the contaminated area and into the fresh air. Get medical advice and attention if you feel unwell.
First-aid measures after skin contact	: Wash with soapy water. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact	: Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Remove contact lenses, if present and easy to do. Continue rinsing. Consult an ophthalmologist if irritation persists.
First-aid measures after ingestion	: Drink plenty of water as a precaution. Get medical advice and attention if you feel unwell.

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

Symptoms/effects after inhalation	: Metal fume fever.
Symptoms/effects after eye contact	: Eye irritation.
Symptoms/effects after ingestion	: Nausea. Vomiting. Diarrhea.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Carbon dioxide. Dry powder. Foam.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire : On combustion or on thermal decomposition (pyrolysis) releases : Carbon oxides (CO, CO₂). Zinc oxide.

5.3. Advice for firefighters

Firefighting instructions	: Contain the extinguishing fluids by bunding (the product is hazardous for the environment). Use water spray or fog for cooling exposed containers.
Protection during firefighting	: Do not attempt to take action without suitable protective equipment. Complete protective clothing. Self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Avoid contact with skin and eyes. Do not breathe dust.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Do not allow product to spread into the environment. Do not discharge into drains or rivers.

6.3. Methods and material for containment and cleaning up

For containment	: Sweep up or vacuum up the product. Collect up the product and place it in a spare container suitably labelled.
Methods for cleaning up	: Dispose of contaminated materials in accordance with current regulations.

6.4. Reference to other sections

For further information refer to section 13.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Ensure good ventilation of the work station. Extraction to remove dust at its source. Avoid contact with skin and eyes. Avoid creating or spreading dust.
- Hygiene measures : Do not drink, eat or smoke in the workplace. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.
- Storage conditions : Store in dry, cool, well-ventilated area. Keep container tightly closed. Protect from moisture.
- Incompatible materials : Strong oxidizing agents.
- Packaging materials : Plastic materials. Polyethylene.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Trizinc Dicitrate Dihydrate (5990-32-9)

DNEL/DMEL (Workers)

Long-term - systemic effects, dermal	3.57 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	1.25 mg/m ³

PNEC (Water)

PNEC aqua (freshwater)	7.8 µg/l
PNEC aqua (marine water)	2 µg/l

PNEC (Sediment)

PNEC sediment (freshwater)	11 mg/kg
PNEC sediment (marine water)	1.1 mg/kg

PNEC (Soil)

PNEC soil	23 mg/kg
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PNEC (STP)

PNEC sewage treatment plant	52 µg/l
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8.2. Exposure controls

Appropriate engineering controls:

Ensure good ventilation of the work station. Extraction to remove dust at its source.

Hand protection:

Protective gloves. The protective gloves to be used must comply with the specifications of EC directive 89/686/EEC and the resultant standard EN 374. Breakthrough time : refer to the recommendations of the supplier

Eye protection:

Safety glasses

Respiratory protection:

If dust are formed : Gas mask with filter type P1/FFP1

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Solid
- Appearance : Powder.
- Molecular mass : 610.36 g/mol
- Colour : White to off-white.
- Odour : Sweetish.
- Odour threshold : No data available
- pH : Not applicable
- Relative evaporation rate (butylacetate=1) : No data available

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Melting point	: 295 °C (Decomposes)
Freezing point	: Not applicable
Boiling point	: Not applicable
Flash point	: Not applicable
Auto-ignition temperature	: No data available
Decomposition temperature	: 165 °C
Flammability (solid, gas)	: No data available
Vapour pressure	: Insignificant (Results obtained on a similar product)
Relative vapour density at 20 °C	: No data available
Relative density	: 1.7 (≥ 2) (20 °C) (results obtained by read-across)
Solubility	: Water: Slightly soluble
Log Pow	: No data available
Log Kow	: -0.2 - -1.8 (Citric acid)
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: Not explosive.
Oxidising properties	: Non oxidizing material according to EC criteria.
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

To our knowledge, the product does not present any particular risk, under normal conditions of use.

10.2. Chemical stability

Stable at ambient temperature and under normal conditions of use.

10.3. Possibility of hazardous reactions

None to our knowledge.

10.4. Conditions to avoid

None to our knowledge.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (dermal)	: Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation)	: Not classified (Based on available data, the classification criteria are not met)

Trizinc Dicitrate Dihydrate (5990-32-9)

LD50 oral rat	> 2000 mg/kg (OECD 401 method)
LD50 dermal rat	> 2000 mg/kg (Results obtained on a similar product) (OECD 402 method)
Skin corrosion/irritation	: Not classified (Based on available data, the classification criteria are not met) pH: Not applicable
Additional information	: (Results obtained on a similar product) (OECD 404 method)
Serious eye damage/irritation	: Causes serious eye irritation. pH: Not applicable
Additional information	: EpiOcular (OECD 492 method)
Respiratory or skin sensitisation	: Not classified (Based on available data, the classification criteria are not met)
Additional information	: (Results obtained on a similar product) (OECD 406 method)
Germ cell mutagenicity	: Not classified (Based on available data, the classification criteria are not met)
Additional information	: (Results obtained on a similar product) (OECD 471 method)
Carcinogenicity	: Not classified (Based on available data, the classification criteria are not met)
Additional information	: (Results obtained on a similar product)
Reproductive toxicity	: Not classified (Based on available data, the classification criteria are not met)

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Additional information	: (Results obtained on a similar product) (OECD 416 method)
STOT-single exposure	: Not classified (Based on available data, the classification criteria are not met)
STOT-repeated exposure	: Not classified (Based on available data, the classification criteria are not met)
Additional information	: (Results obtained on a similar product) (OECD 408 method)

Trizinc Dicitrate Dihydrate (5990-32-9)

NOAEL (oral, rat, 90 days)	234 mg/kg bodyweight/day (male)
Aspiration hazard	: Not classified (Technical impossibility to obtain the data)

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity	: Very toxic to aquatic life.
Chronic aquatic toxicity	: Toxic to aquatic life with long lasting effects.

Trizinc Dicitrate Dihydrate (5990-32-9)

LC50 fish	0.4 mg/l/96h (Leuciscus idus) (Results obtained on a similar product)
EC50 Daphnia	0.2 mg/l/48 h (Daphnia magna) (Results obtained on a similar product)
NOEC chronic algae	0.015 mg/l/72 h (P. subcapitata) (Results obtained on a similar product)

12.2. Persistence and degradability

Trizinc Dicitrate Dihydrate (5990-32-9)

Persistence and degradability	Readily biodegradable. 97 % biodegradation. (28 days). (OECD 301B method). (Results obtained on a similar product).
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12.3. Bioaccumulative potential

Trizinc Dicitrate Dihydrate (5990-32-9)

Log Kow	-0.2 - -1.8 (Citric acid)
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12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

Trizinc Dicitrate Dihydrate (5990-32-9)

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods	: Dispose of in accordance with relevant local regulations.
Product/Packaging disposal recommendations	: Destroy at an authorised site. Discharging into rivers and drains is forbidden.
Additional information	: Empty the packaging completely prior to disposal. Recycle or dispose of in compliance with current legislation.

SECTION 14: Transport information

In accordance with ADR / IATA / IMDG

ADR	IMDG	IATA
14.1. UN number		
UN 3077	UN 3077	UN 3077
14.2. UN proper shipping name		
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc citrate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc citrate)	Environmentally hazardous substance, solid, n.o.s. (Zinc citrate)
14.3. Transport hazard class(es)		
9	9	9

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14.4. Packing group


III	III	III
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14.5. Environmental hazards

Dangerous for the environment : Yes	Dangerous for the environment : Yes Marine pollutant : Yes	Dangerous for the environment : Yes
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14.6. Special precautions for user

Overland transport

Classification code (ADR)	: M7
Special provisions (ADR)	: 274, 335, 601, 375
Limited quantities (ADR)	: 5kg
Excepted quantities (ADR)	: E1
Packing instructions (ADR)	: P002, IBC08, LP02, R001
Mixed packing provisions (ADR)	: MP10
Portable tank and bulk container instructions (ADR)	: T1, BK1, BK2
Portable tank and bulk container special provisions (ADR)	: TP33
Tank code (ADR)	: SGAV, LGBV
Vehicle for tank carriage	: AT
Transport category (ADR)	: 3
Special provisions for carriage - Packages (ADR)	: V13
Special provisions for carriage - Bulk (ADR)	: VC1, VC2
Special provisions for carriage - Loading, unloading and handling (ADR)	: CV13
Hazard identification number (Kemler No.)	: 90
Orange plates	: 

Tunnel restriction code (ADR)	: E
EAC code	: 2Z

Transport by sea

Special provisions (IMDG)	: 274, 335, 966, 967, 969
Limited quantities (IMDG)	: 5 kg
Excepted quantities (IMDG)	: E1
Packing instructions (IMDG)	: P002, LP02
Special packing provisions (IMDG)	: PP12
IBC packing instructions (IMDG)	: IBC08
IBC special provisions (IMDG)	: B3
Tank instructions (IMDG)	: T1, BK1, BK2, BK3
Tank special provisions (IMDG)	: TP33
EmS-No. (Fire)	: F-A
EmS-No. (Spillage)	: S-F
Stowage category (IMDG)	: A
Stowage and handling (IMDG)	: SW23
MFAG-No	: 171

Air transport

PCA Excepted quantities (IATA)	: E1
PCA Limited quantities (IATA)	: Y956
PCA limited quantity max net quantity (IATA)	: 30kgG
PCA packing instructions (IATA)	: 956
PCA max net quantity (IATA)	: 400kg
CAO packing instructions (IATA)	: 956

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CAO max net quantity (IATA) : 400kg
Special provisions (IATA) : A97, A158, A179, A197
ERG code (IATA) : 9L

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

Trizinc Dicitrate Dihydrate is not on the REACH Candidate List

Trizinc Dicitrate Dihydrate is not on the REACH Annex XIV List

Trizinc Dicitrate Dihydrate is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.

Trizinc Dicitrate Dihydrate is not subject to Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:

This sheet was updated (refer to the date at the top of this page). SDS changed sections : 14.

Data sources : CSR (Chemical safety report). REACH registration.
Other information : Safety data sheet established by : LISAM SERVICES - TELEGIS
17 rue de la Couture F-60400 Passel
www.lisam-telegis.fr.

Full text of H- and EUH-statements:

Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
H319	Causes serious eye irritation.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

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ANNEX TO THE SAFETY DATA SHEET

Identified Uses	Es N°	Short title	Page
Formulation of preparations	1		8
Consumer use	2		15

1. 1: Formulation of preparations

1.1. Title section

Formulation of preparations

ES Ref.: 1
ES Type: Worker
Version: 2.0
Revision date: 10/09/2018

Date of issue: 01/07/2013

Environment		
	Contributing scenario controlling environmental exposure	ERC2
	Contributing scenario controlling environmental exposure	ERC3
Worker		
	Worker Contributing Scenario	PROC2
	Worker Contributing Scenario	PROC3
	Worker Contributing Scenario	PROC4
	Worker Contributing Scenario	PROC4
	Worker Contributing Scenario	PROC5
	Worker Contributing Scenario	PROC5
	Worker Contributing Scenario	PROC8a
	Worker Contributing Scenario	PROC8b
	Worker Contributing Scenario	PROC9

Processes, tasks, activities covered

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC2)

ERC2	Formulation into mixture
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Product (article) characteristics

Physical form of product	Powder
Volatility	Low volatility

Amount used, frequency and duration of use (or from service life)

Maximum daily site tonnage (kg/d):	(Zn) 140
Annual site tonnage (tons/year):	(Zn) 42

Technical and organisational conditions and measures

Removal of solids in settling tanks	
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Conditions and measures related to sewage treatment plant

Size of the STP : 2000 m ³ /day (by default)	
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Conditions and measures related to treatment of waste (including article waste)

Reprocess or burn in an approved incinerator	
Controlled application to agricultural soil	

1.2.2. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC3)

ERC3	Formulation into solid matrix
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Product (article) characteristics

Physical form of product	Powder
Volatility	Low volatility

Amount used, frequency and duration of use (or from service life)

Maximum daily site tonnage (kg/d):	(Zn) 140
Annual site tonnage (tons/year):	(Zn) 42

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Technical and organisational conditions and measures	
Removal of solids in settling tanks	
Conditions and measures related to sewage treatment plant	
Size of the STP : 2000 m ³ /day (by default)	
Conditions and measures related to treatment of waste (including article waste)	
Reprocess or burn in an approved incinerator	
Controlled application to agricultural soil	
1.2.3. Control of worker exposure: Worker Contributing Scenario (PROC2)	
PROC2	Use in closed, continuous process with occasional controlled exposure
Product (article) characteristics	
Physical form of product	Powder
Dustiness	Solid, high dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	> 4 h/day
1 time a day	
Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	
Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	
Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 480 (two hands, face side only)	
Respiration volume	10 m ³
1.2.4. Control of worker exposure: Worker Contributing Scenario (PROC3)	
PROC3	Use in closed batch process (synthesis or formulation)
Product (article) characteristics	
Physical form of product	Powder
Dustiness	Solid, high dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	> 4 h/day
1 time a day	
Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	
Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	
Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 240 (one hand, face side only)	
Respiration volume	10 m ³
1.2.5. Control of worker exposure: Worker Contributing Scenario (PROC4)	
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
Product (article) characteristics	
Physical form of product	Powder
Dustiness	Solid, high dustiness
Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	1-4 h/day
1 time a day	

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Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	

Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	

Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 480 (two hands, face side only)	
Respiration volume	10 m ³

1.2.6. Control of worker exposure: Worker Contributing Scenario (PROC4)	
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises

Product (article) characteristics	
Physical form of product	Powder
Dustiness	Solid, high dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	15min- 1 h/day
1 time a day	

Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	

Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	

Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 480 (two hands, face side only)	
Respiration volume	10 m ³

1.2.7. Control of worker exposure: Worker Contributing Scenario (PROC5)	
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Product (article) characteristics	
Physical form of product	Powder, Solid in solution
Dustiness	Solid, high dustiness, Solid, low dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	1-4 h/day
1 time a day	

Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	

Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	

Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 480 (two hands, face side only)	
Respiration volume	10 m ³

1.2.8. Control of worker exposure: Worker Contributing Scenario (PROC5)	
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

Product (article) characteristics	
Physical form of product	Powder, Solid in solution
Dustiness	Solid, high dustiness, Solid, low dustiness

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Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	15min- 1 h/day
1 time a day	

Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	

Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	

Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 480 (two hands, face side only)	
Respiration volume	10 m ³

1.2.9. Control of worker exposure: Worker Contributing Scenario (PROC8a)

PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
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Product (article) characteristics	
Physical form of product	Powder
Dustiness	Solid, high dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	15min- 1 h/day
1 time a day	

Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	

Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	

Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 960 (two hands)	
Respiration volume	10 m ³

1.2.10. Control of worker exposure: Worker Contributing Scenario (PROC8b)

PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
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Product (article) characteristics	
Physical form of product	Powder
Dustiness	Solid, high dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	15min- 1 h/day
1 time a day	

Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	

Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	

Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 480 (two hands, face side only)	
Respiration volume	10 m ³

1.2.11. Control of worker exposure: Worker Contributing Scenario (PROC9)

PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
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Product (article) characteristics	
Physical form of product	Powder
Dustiness	Solid, high dustiness

Amount used (or contained in articles), frequency and duration of use/exposure	
Exposure duration	15min- 1 h/day
1 time a day	

Technical and organisational conditions and measures	
Local exhaust ventilation - efficiency of at least	90
Handle in accordance with good industrial hygiene and safety practice	
Avoid raising powdered material due to explosion hazard, Prevent the build-up of electrostatic charge	

Conditions and measures related to personal protection, hygiene and health evaluation	
Impermeable protective gloves. Safety glasses. Protective clothing	

Other conditions affecting workers exposure	
Exposed skin surface (cm ²) : 480 (two hands, face side only)	
Respiration volume	10 m ³

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC2)

Release route		Release rate		Release estimation method	
Release fraction to wastewater		0.02		(ERC 2)	
Release fraction to wastewater		0.0009		(TGD II,2,A)	
Release fraction to air from process		0.00002		(TGD II,2,A)	
Release fraction to air from process		0.0002		(TGD IV,2,A)	
Protection target	Unit	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	µg/l	0.217	7.8	0.028	EUSES
Marine water	µg/l	0.0264	2	0.013	EUSES
Freshwater sediment	mg/kg	5.19	11	0.472	EUSES
Marine water sediment	mg/kg	0.632	1.1	0.575	EUSES
Sewage treatment plant	µg/l	3.5	52	0.067	EUSES
Soil	mg/kg	1.15	23	0.05	EUSES

1.3.2. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC3)

Release route		Release rate		Release estimation method	
Release fraction to wastewater		0.002		(ERC 3)	
Release fraction to wastewater		0.02		(TGD II,2.1,A)	
Release fraction to air from process		0.3		(ERC 3)	
Release fraction to air from process		0.001		(TGD II,2.1,A)	
Protection target	Unit	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	µg/l	0.217	7.8	0.028	EUSES
Marine water	µg/l	0.0264	2	0.013	EUSES
Freshwater sediment	mg/kg	5.19	11	0.472	EUSES
Marine water sediment	mg/kg	0.632	1.1	0.575	EUSES
Sewage treatment plant	µg/l	3.5	52	0.067	EUSES
Soil	mg/kg	1.15	23	0.05	EUSES

1.3.3. Worker exposure Worker Contributing Scenario (PROC2)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	0.1 mg/m ³	0.08	ECETOC TRA worker
Sum RCR - Long-term - systemic effects		0.08	

1.3.4. Worker exposure Worker Contributing Scenario (PROC3)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	0.1 mg/m ³	0.08	ECETOC TRA worker
Sum RCR - Long-term -		0.08	

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systemic effects			
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1.3.5. Worker exposure Worker Contributing Scenario (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	1.5 mg/m ³	1.2	ECETOC TRA worker
Sum RCR - Long-term - systemic effects		1.2	

1.3.6. Worker exposure Worker Contributing Scenario (PROC4)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	0.5 mg/m ³	0.4	ECETOC TRA worker
Sum RCR - Long-term - systemic effects		0.4	

1.3.7. Worker exposure Worker Contributing Scenario (PROC5)

Information for contributing exposure scenario			
Dermal uptake of solid citrates is expected to be negligible and is not considered, Dermal uptake factor of 0.02 applied for the liquid formulation			
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.016 mg/kg bw/day	0.004	ECETOC TRA worker
Inhalation - Long-term - systemic effects	1.5 mg/m ³	1.2	ECETOC TRA worker
Sum RCR - Long-term - systemic effects		1.204	

1.3.8. Worker exposure Worker Contributing Scenario (PROC5)

Information for contributing exposure scenario			
Dermal uptake of solid citrates is expected to be negligible and is not considered, Dermal uptake factor of 0.02 applied for the liquid formulation			
Route of exposure and type of effects	Exposure estimate	RCR	Method
Dermal - Long-term - systemic effects	0.0054 mg/kg bw/day	0.002	ECETOC TRA worker
Inhalation - Long-term - systemic effects	0.5 mg/m ³	0.4	ECETOC TRA worker
Sum RCR - Long-term - systemic effects		0.402	

1.3.9. Worker exposure Worker Contributing Scenario (PROC8a)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	1 mg/m ³	0.8	ECETOC TRA worker
Sum RCR - Long-term - systemic effects		0.8	

1.3.10. Worker exposure Worker Contributing Scenario (PROC8b)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	0.5 mg/m ³	0.4	ECETOC TRA worker
Sum RCR - Long-term - systemic effects		0.4	

1.3.11. Worker exposure Worker Contributing Scenario (PROC9)

Route of exposure and type of effects	Exposure estimate	RCR	Method
Inhalation - Long-term - systemic effects	0.4 mg/m ³	0.32	ECETOC TRA worker
Sum RCR - Long-term - systemic effects		0.32	

1.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

1.4.1. Environment

Guidance - Environment	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for environment.
Environment Scaling Method	EUSES v 2.1.1

1.4.2. Health

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Guidance - Health	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.
Health Scaling Method	ECETOC TRA worker

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2. 2: Consumer use

2.1. Title section

Consumer use

ES Ref.: 2
ES Type: Consumer
Version: 1.0

Date of issue: 23/02/2016

Environment		
	Contributing scenario controlling environmental exposure	ERC8a
Consumer		
	Contributing scenario consumer end-use	PC39

Processes, tasks, activities covered	Consumer use
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2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Contributing scenario controlling environmental exposure (ERC8a)

ERC8a	Wide dispersive indoor use of processing aids in open systems
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Product (article) characteristics

Physical form of product	Solid
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Amount used, frequency and duration of use (or from service life)

Annual amount used in the EU	350 t/yr
Fraction of EU tonnage used in region:	10 %
Fraction of Regional tonnage used locally:	0.0005
Amounts used	0.05 kg/day (Zn)
Emission days	365

2.2.2. Control of consumer exposure: Contributing scenario consumer end-use (PC39)

PC39	Cosmetics, personal care products
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Product (article) characteristics

Physical form of product	Solid
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2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure Contributing scenario controlling environmental exposure (ERC8a)

Release route		Release rate			Release estimation method
Release fraction to air from wide dispersive use (regional only):		0 %			
Release fraction to wastewater from wide dispersive use:		100 %			
Protection target	Unit	Exposure estimation	PNEC	RCR	Assessment method
Freshwater	µg/l	0.175	7.8	0.022	EUSES
Marine water	µg/l	0.0222	2	0.011	EUSES
Freshwater sediment	mg/kg	4.19	11	0.381	EUSES
Marine water sediment	mg/kg	0.531	1.1	0.483	EUSES
Sewage treatment plant	µg/l	24	52	0.462	EUSES
Soil	mg/kg	0.787	23	0.034	EUSES

2.3.2. Consumer exposure Contributing scenario consumer end-use (PC39)

Information for contributing exposure scenario

In accordance to the Article 14 (5b) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation for human health does not need to be performed for end uses in cosmetic products within the scope of Directive 76/768/EEC

2.4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

2.4.1. Environment

Guidance - Environment	No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for environment.
Environment Scaling Method	EUSES v 2.1.1

2.4.2. Health

Guidance - Health	Consumer use of this product is covered by the conditions of the EU Cosmetics Directive 76/768/EEC and will not be addressed under this review
Health Scaling Method	ECETOC TRA worker

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Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830
