



S.A. LIPMES

08243 Manresa (Barcelona)

Date printed 27.04.2017, Revision 27.04.2017

Version 03. Supersedes version: 02

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**SECTION 1: Identification of the substance/mixture and of the company/undertaking**
**1.1 Product identifier**
**Zink chloride Granules-Powder**

Registration number	01-2119472431-44-0001
IUPAC	Zinc chloride
EU-INDEX	030-003-00-2
EINECS/ELINCS	231-592-0
CAS	7646-85-7

Distributed by:



4621 Technology Drive, Golden, CO 80403

ph: (303) 762-0800 fax: (303) 762-1240

Part #: Z1006

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

Raw material for industrial applications  
Usage only in accordance with the identified usages as stipulated in the CSR/CSA.

**1.2.2 Uses advised against**

None known.

**1.3 Details of the supplier of the safety data sheet**

Company	S.A. LIPMES Creu Guixera s/n 08243 Manresa (Barcelona) / SPAIN Phone +34 938770447 Fax +34 938741160 E-mail lipmes@lipmes.com
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**Address enquiries to**

Technical information	lipmes@lipmes.com
Safety Data Sheet	sdb@chemiebuero.de

**1.4 Emergency telephone number**

Advisory body	+49 (0)89-19240 (24h) (english)
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**SECTION 2: Hazards identification**
**2.1 Classification of the substance or mixture**

Acute Tox. 4: H302 Harmful if swallowed.  
Skin Corr. 1B: H314 Causes severe skin burns and eye damage.  
Eye Dam. 1: H318 Causes serious eye damage.  
STOT SE 3: H335 May cause respiratory irritation.  
Aquatic Acute 1: H400 Very toxic to aquatic life.  
Aquatic Chronic 1: H410 Very toxic to aquatic life with long lasting effects.



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## 2.2 Label elements

	The product is required to be labelled in accordance with regulation (EC) No 1272/2008 (CLP).
<b>Hazard pictograms</b>	  
<b>Signal word</b>	DANGER
<b>Contains:</b>	Zinc chloride EU-INDEX 030-003-00-2
<b>Hazard statements</b>	H302 Harmful if swallowed. H314 Causes severe skin burns and eye damage. H335 May cause respiratory irritation. H410 Very toxic to aquatic life with long lasting effects.
<b>Precautionary statements</b>	P260 Do not breathe dust. P280 Wear protective gloves / protective clothing / eye protection / face protection. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P273 Avoid release to the environment. P405 Store locked up. P501 Dispose of contents/container in accordance with local/national regulation.

## 2.3 Other hazards

<b>Environmental hazards</b>	The product/the substance has the Water Hazard Class 3.
<b>Other hazards</b>	Further hazards were not determined with the current level of knowledge.

## SECTION 3: Composition / Information on ingredients

### Product-type:

The product is a substance.

Range [%]	Substance
~100	Zinc chloride
	CAS: 7646-85-7, EINECS/ELINCS: 231-592-0, EU-INDEX: 030-003-00-2, Reg-No.: 01-2119472431-44-XXXX
	GHS/CLP: Acute Tox. 4: H302 - Skin Corr. 1B: H314 - Aquatic Acute 1: H400 - Aquatic Chronic 1: H410, M = 1

<b>Comment on component parts</b>	Substances of Very High Concern - SVHC: substances are not contained or are below 0.1%. For full text of H-statements: see SECTION 16.
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## SECTION 4: First aid measures

### 4.1 Description of first aid measures

<b>General information</b>	Take off contaminated clothing and wash before reuse.
<b>Inhalation</b>	Consult a doctor immediately. Ensure supply of fresh air. In case of respiratory arrest induce breathing with a respiratory device. Seek medical advice.
<b>Skin contact</b>	Immediate medical treatment necessary, as untreated burns can result in slow-healing wounds. In case of contact with skin wash off immediately with plenty of water.
<b>Eye contact</b>	In case of contact with eyes rinse thoroughly with plenty of water and seek medical advice. Shield unaffected eye.
<b>Ingestion</b>	Consult a doctor immediately. Do not induce vomiting. Rinse out mouth and give plenty of water to drink.

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

No information available.

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



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## SECTION 5: Fire-fighting measures

### 5.1 Extinguishing media

**Suitable extinguishing media** Product itself is non-combustible. Fire extinguishing method of surrounding areas must be considered.

**Extinguishing media that must not be used** Full water jet.

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

In the event of fire the following can be released:  
Hydrogen chloride (HCl).

### 5.3 Advice for firefighters

Use self-contained breathing apparatus.  
Wear full protective suit.

Fire residues and contaminated firefighting water must be disposed of in accordance within the local regulations.

## SECTION 6: Accidental release measures

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

Use personal protective equipment.  
Avoid dust formation.  
Use breathing apparatus if exposed to dust.

### 6.2 Environmental precautions

Do not discharge into the drains/surface waters/groundwater.

### 6.3 Methods and material for containment and cleaning up

Avoid raising dust.  
Take up mechanically.  
Dispose of absorbed material in accordance within the regulations.

### 6.4 Reference to other sections

See SECTION 8+13

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Avoid the formation and deposition of dust.  
Provide vacuuming if dust raised.  
Use breathing apparatus when transferring large quantities without vacuuming facilities.  
No special measures necessary.  
Do not eat, drink or smoke when using this product.  
Clean skin thoroughly after work, apply skin cream.  
Use barrier skin cream.  
Contaminated work clothing should not be allowed out of the workplace.  
Take off contaminated clothing and wash before reuse.

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

Provide acid-resistant floor.  
Do not store with alkalies.  
Store in a dry place.  
Keep container tightly closed.  
Keep container in a well-ventilated place.

### 7.3 Specific end use(s)

See product use, SECTION 1.2  
Usage only in accordance with the identified usages as stipulated in the CSR/CSA.



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## SECTION 8: Exposure controls / personal protection

### 8.1 Control parameters

#### Ingredients with occupational exposure limits to be monitored (GB)

Substance
Zinc chloride
CAS: 7646-85-7, EINECS/ELINCS: 231-592-0, EU-INDEX: 030-003-00-2, Reg-No.: 01-2119472431-44-XXXX
Long-term exposure: 1 mg/m <sup>3</sup> , fume
Short-term exposure (15-minute): 2 mg/m <sup>3</sup>

#### DNEL

Substance
Zinc chloride, CAS: 7646-85-7
Industrial, inhalative, Long-term - systemic effects: 1 mg Zn/m <sup>3</sup> .
Industrial, dermal, Long-term - systemic effects: 8,3 mg Zn/kg bw/d.
general population, inhalative, Long-term - systemic effects: 1,3 mg Zn/m <sup>3</sup> .
general population, dermal, Long-term - systemic effects: 8,3 mg Zn/kg bw/d.
general population, oral, Long-term - systemic effects: 0,83 mg Zn/kg bw/d.

#### PNEC

Substance
Zinc chloride, CAS: 7646-85-7
sewage treatment plants (STP), 100 µg/l (AF=1).
soil, 35,6 mg/kg dw (AF=1).
sediment (seaater), 56,5 mg/kg dw (AF=1).
sediment (freshwater), 117,8 mg/kg dw (AF=1).
seawater, 6,1 µg/l (AF=1).
freshwater, 20,6 µg/l (AF=1).

### 8.2 Exposure controls

<b>Additional advice on system design</b>	Ensure adequate ventilation on workstation. Generic Exposure Scenarios only in accordance with the identified usages as stipulated in the CSR/CSA. Measurement methods for taking workplace measurements must meet the performance requirements of DIN EN 482. For example, recommendations are given in the IFA's list of hazardous substances.
<b>Eye protection</b>	Tightly fitting goggles. (EN 166:2001)
<b>Hand protection</b>	The details concerned are recommendations. Please contact the glove supplier for further information. In full contact: > 0,7 mm; Nitrile rubber, >480 min (EN 374-1/-2/-3). In splash contact: > 0,7 mm; Nitrile rubber, >480 min (EN 374-1/-2/-3).
<b>Skin protection</b>	Acid-resistant protective clothing.
<b>Other</b>	Personal protective equipment should be selected specifically for the working place, depending on concentration and quantity handled. The resistance of this equipment to chemicals should be ascertained with the respective supplier. Avoid contact with eyes and skin. Do not inhale dust.
<b>Respiratory protection</b>	Respiratory protection mask in the event of high concentrations. Short term: filter apparatus, filter P2. (DIN EN 143)
<b>Thermal hazards</b>	not applicable
<b>Delimitation and monitoring of the environmental exposition</b>	Comply with applicable environmental regulations limiting discharge to air, water and soil.



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## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Form	crystalline solid in different forms
Color	white
Odor	odourless
Odour threshold	not applicable
pH-value	>5 (100g/l 20°C)
pH-value [1%]	No information available.
Boiling point [°C]	732
Flash point [°C]	No information available.
Flammability (solid, gas) [°C]	The product is not explosive. The product is not combustible.
Lower explosion limit	not applicable
Upper explosion limit	not applicable
Oxidising properties	no
Vapour pressure/gas pressure [kPa]	1,33 hPa (428°C)
Density [g/ml]	2,93 (22°C)
Bulk density [kg/m³]	1800
Solubility in water	851 g/l (20°C)
Partition coefficient [n-octanol/water]	No information available.
Viscosity	not applicable
Relative vapour density determined in air	not applicable
Evaporation speed	not applicable
Melting point [°C]	287 (1013 hPa)
Autoignition temperature [°C]	not applicable
Decomposition temperature [°C]	~ 360

### 9.2 Other information

No information available.

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No dangerous reactions known if used as directed.

### 10.2 Chemical stability

Stable under normal ambient conditions (ambient temperature).

### 10.3 Possibility of hazardous reactions

Reactions with alkalis (lyes).

### 10.4 Conditions to avoid

Reactions with damp air and moisture.  
Strong heating.

### 10.5 Incompatible materials

Various metals.  
Cyanides and sulfides.



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**10.6 Hazardous decomposition products**

No hazardous decomposition products known.

**SECTION 11: Toxicological information****11.1 Information on toxicological effects****Acute toxicity**

Substance
Zinc chloride, CAS: 7646-85-7
LD50, dermal, Rat: > 2000 mg/kg bw.
LD50, oral, Rat: 1100 mg/kg bw (528 mg Zn/kg bw).
LC50, inhalative, Rat: 2000 mgZnCl2/m³.

<b>Serious eye damage/irritation</b>	Risk of serious damage to eyes. Based on the available information, the classification criteria are fulfilled.
<b>Skin corrosion/irritation</b>	Product is caustic. Based on the available information, the classification criteria are fulfilled.
<b>Respiratory or skin sensitisation</b>	Non-sensitizing. Based on the available information, the classification criteria are not fulfilled.
<b>Specific target organ toxicity — single exposure</b>	May cause respiratory irritation. Based on the available information, the classification criteria are fulfilled.
<b>Specific target organ toxicity — repeated exposure</b>	Based on the available information, the classification criteria are not fulfilled.
<b>Mutagenicity</b>	Ames-test: negative. Based on the available information, the classification criteria are not fulfilled.
<b>Reproduction toxicity</b>	Based on the available information, the classification criteria are not fulfilled.
<b>Carcinogenicity</b>	Based on the available information, the classification criteria are not fulfilled.
<b>Aspiration hazard</b>	Based on the available information, the classification criteria are not fulfilled.
<b>General remarks</b>	

The toxicological data are those of the pure product.

**SECTION 12: Ecological information****12.1 Toxicity**

Substance
Zinc chloride, CAS: 7646-85-7
LC50, (48h), Daphnia magna: 1220 µg Zn/l.
LC50, (96h), fish: 439 µg Zn/l.
LC50, (96h), Pimephales promelas: 0,78 mg Zn/l (Lit.).
LC50, (96h), Oncorhynchus mykiss: 0,169 mg Zn/l.
EC50, (48h), Ceriodaphnia dubia: 0,147 - 0,413 mg Zn/l (Lit.).
IC50, (72h), Selenastrum capricornutum: 0,136 mg Zn/l (Lit.).

**12.2 Persistence and degradability**

<b>Behaviour in environment compartments</b>	not determined
<b>Behaviour in sewage plant</b>	not determined
<b>Biological degradability</b>	not applicable

**12.3 Bioaccumulative potential**

No information available.



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**12.4 Mobility in soil**

No information available.

**12.5 Results of PBT and vPvB assessment**

not applicable

**12.6 Other adverse effects**

Do not discharge product unmonitored into the environment.

**SECTION 13: Disposal considerations****13.1 Waste treatment methods**

Waste material must be disposed of in accordance with the Directive on waste 2008/98/EC as well as other national and local regulations. It is not possible to determine a waste code for this product in accordance with the European Waste Catalogue (EWC) since it is only possible to classify it according to how it is used by the customer. The waste code is to be determined within the EU in liaison with the waste-disposal operator.

**Product**

Dispose of as hazardous waste.  
Coordinate disposal with the disposal contractor/authorities if necessary.

**Waste no. (recommended)**

060313\*

**Contaminated packaging**

Packaging that cannot be cleaned should be disposed of as for product.  
Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

**Waste no. (recommended)**

150110\*

**SECTION 14: Transport information****14.1 UN number**

Transport by land according to  
ADR/RID 2331

Inland navigation (ADN) 2331

Marine transport in accordance with  
IMDG 2331

Air transport in accordance with IATA 2331



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**14.2 UN proper shipping name**

Transport by land according to ADR/RID Zinc chloride, anhydrous  
 - Classification Code C2  
 - Label   
 - ADR LQ 5 kg  
 - ADR 1.1.3.6 (8.6) Transport category (tunnel restriction code) 3 (E)

Inland navigation (ADN) Zinc chloride, anhydrous  
 - Classification Code C2  
 - Label 

Marine transport in accordance with IMDG Zinc chloride, anhydrous  
 - EMS F-A, S-B  
 - Label   
 - IMDG LQ 5 kg

Air transport in accordance with IATA Zinc chloride, anhydrous  
 - Label 

**14.3 Transport hazard class(es)**

Transport by land according to ADR/RID 8  
 Inland navigation (ADN) 8  
 Marine transport in accordance with IMDG 8  
 Air transport in accordance with IATA 8

**14.4 Packing group**

Transport by land according to ADR/RID III  
 Inland navigation (ADN) III  
 Marine transport in accordance with IMDG III  
 Air transport in accordance with IATA III





**14.5 Environmental hazards**

Transport by land according to ADR/RID	yes
Inland navigation (ADN)	yes
Marine transport in accordance with IMDG	MARINE POLLUTANT
Air transport in accordance with IATA	yes

**14.6 Special precautions for user**

Relevant information under SECTION 6 to 8.

**14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code**

No information available.

**SECTION 15: Regulatory information**

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

<b>EEC-REGULATIONS</b>	1991/689 (2001/118); 2010/75; 2004/42; 648/2004; 1907/2006 (REACH); 1272/2008; 75/324/EEC (2008/47/EC); (EU) 2015/830; (EU) 2016/131; (EU) 517/2014
<b>TRANSPORT-REGULATIONS</b>	DOT-Classification, ADR (2017); IMDG-Code (2017, 38. Amdt.); IATA-DGR (2017).
<b>NATIONAL REGULATIONS (GB):</b>	EH40/2005 Workplace exposure limits (Second edition, published December 2011). CHIP 3/ CHIP 4
- Observe employment restrictions for people	Observe employment restrictions for mothers-to-be and nursing mothers. Observe employment restrictions for young people.
- VOC (2010/75/CE)	not applicable

**15.2 Chemical safety assessment**

For this substance a chemical safety assessment has been carried out.

**SECTION 16: Other information**

**16.1 Hazard statements (SECTION 03)**

H410 Very toxic to aquatic life with long lasting effects.  
 H400 Very toxic to aquatic life.  
 H314 Causes severe skin burns and eye damage.  
 H302 Harmful if swallowed.



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**16.2 Abbreviations and acronyms:**

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route  
 RID = Règlement concernant le transport international ferroviaire de marchandises dangereuses  
 ADN = Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure  
 ATE = acute toxicity estimate  
 CAS = Chemical Abstracts Service  
 CLP = Classification, Labelling and Packaging  
 DMEL = Derived Minimum Effect Level  
 DNEL = Derived No Effect Level  
 EC50 = Median effective concentration  
 ECB = European Chemicals Bureau  
 EEC = European Economic Community  
 EINECS = European Inventory of Existing Commercial Chemical Substances  
 ELINCS = European List of Notified Chemical Substances  
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
 IATA = International Air Transport Association  
 IBC-Code = International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk  
 IC50 = Inhibition concentration, 50%  
 IMDG = International Maritime Code for Dangerous Goods  
 IUCLID = International Uniform Chemical Information Database  
 LC50 = Lethal concentration, 50%  
 LD50 = Median lethal dose  
 LC0 = lethal concentration, 0%  
 LOAEL = lowest-observed-adverse-effect level  
 MARPOL = International Convention for the Prevention of Marine Pollution from Ships  
 NOAEL = No Observed Adverse Effect Level  
 NOEC = No Observed Effect Concentration  
 PBT = Persistent, Bioaccumulative and Toxic substance  
 PNEC = Predicted No-Effect Concentration  
 REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals  
 STP = Sewage Treatment Plant  
 TLV®/TWA = Threshold limit value – time-weighted average  
 TLV®STEL = Threshold limit value – short-time exposure limit  
 VOC = Volatile Organic Compounds  
 vPvB = very Persistent and very Bioaccumulative

**16.3 Other information****Customs Tariff**

not determined

**Classification procedure**

Acute Tox. 4: H302 Harmful if swallowed. (Harmonised Classification)  
 Skin Corr. 1B: H314 Causes severe skin burns and eye damage. (Harmonised Classification)  
 Eye Dam. 1: H318 Causes serious eye damage. (Harmonised Classification)  
 STOT SE 3: H335 May cause respiratory irritation. (Harmonised Classification)  
 Aquatic Acute 1: H400 Very toxic to aquatic life. (Harmonised Classification)  
 Aquatic Chronic 1: H410 Very toxic to aquatic life with long lasting effects. (Harmonised Classification)

**Modified position**

SECTION 16 been added: GENERAL REVIEW

Number (ES)	Exposure Scenario Title	Chemical product category [PC]	Life cycle stage covered by ES						Sector of use category [SU]	Process category [PROC]	Article Category [AC]	Category [LRC]
			Manufacture	Formulation	End use			Service life				
					Industrial	Professional	Consumer					
1	Zinc chloride recovery	19, 20, 21	X					X	8, 9	2, 3, 5, 8b, 9, 26		
2	Zinc chloride production and refining	20, 21	X					X	8, 9	2, 3, 5, 8b, 9, 26		
6	Production of inorganic zinc compounds	19, 20, 21	X					X	8, 9, 10	2, 3, 8b, 9, 15	1,	
7	Electroplating	7, 14	X					X	15, 17, 0.Nace C25.6.1	13, 21	2, 7	
8	Electroplating	7, 14	X					X	0.Nace C25.6.1, 15, 17	3, 8b, 21	2, 7	
9	Zinc production by electrowinning	7	X					X	0.NACE C24.4.3, 14	2, 8b, 22, 26		
10	Production of Zinc chloride based fluxing agents	19, 20, 21	X					X	8, 9, 10	2, 3, 5, 8b, 9, 15	1, 2	
11	steel surface treatment prior to hot-dip galvanizing	14, 38	X					X	8, 14, 15, 18, 19, 0.Nace C23.9.9	2, 4, 8b, 13, 25	1, 2, 3, 7, 5, 8	
13	Laboratory reagents	19, 21, 28, 39	X					X	10, 24	1, 2, 3, 4, 5, 8b, 9, 15	1, 2, 6b,	
14	Catalytic agent	19, 20	X					X	9, 10	4, 5, 8b, 9, 15	4	
15	Zinc production by pyrometallurgy	7	X					X	14, 0.NACE C24.4.3	2, 8b, 23, 26		
16	Production of organic zinc compounds	19, 20, 21, 24, 29, 39	X					X	9, 10	1, 2, 3, 4, 8b, 9, 15	1,	
17	Production of organic pigments	9a, 9b, 9c	X					X	8, 9, 10, 13	1, 2, 3, 4, 5, 8b, 9, 22	1	

Number (ES)	Exposure Scenario Title	Chemical product category [PC]	Life cycle stage covered by ES					Sector of use category [SU]	Process category [PROC]	Article Category [AC]	Category [ENC]	
			Manufacture	Formulation	End use							Service life
					Industrial	Professional	Consumer					
18	Production of coatings, paints, inks, enamels, varnishes	1, 9a, 9b, 9c, 14, 15, 18, 26, 32	X			X	5, 8, 9, 10, 11, 12, 13, 14	1, 2, 3, 4, 5, 8b, 9		1, 2,		
19	Formulation of abrasive material for tools	9b, 14, 15, 20	X			X	8, 9, 10, 13, 14, 18	1, 2, 3, 4, 5, 8b, 9, 14, 22, 26		1, 11,		
20	Component for paper coating or treatment for paper products	9a, 15, 18, 21, 35, 20, 23, 34	X			X	6b, 7, 8, 9, 10	3, 4, 5, 6, 8b, 9, 13		2,		
21	Use of ZnCl2 containing paper coatings	1, 9a, 9b, 9c, 15, 18	X		X	X	6b, 10	4, 5, 6, 8b, 9, 10, 13, 19	0	8a, 8		
22	Textile and leather coating treatment	9a, 15, 19, 20, 21, 23, 34, 35	X			X	5, 8, 9, 10	3, 4, 5, 6, 8b, 9, 13	5, 6	2		
23	Use of ZnCl2 containing coatings for textile and leather	15, 23, 34	X		X	X	5, 10	4, 5, 6, 19, 8b, 9, 13	5, 6	8a, 8		
24	Additive in the manufacturing of electronic components	20, 33	X			X	10, 13, 16, 0.NACE C26.1.1:	3, 5, 8b, 9, 14, 22	2, 4	3		
25	Batteries /fuel cells	14, 19, 20, 21	X			X	16, 0.NACE-CodeC2	3, 5, 13, 14	3	3		
26	Component for production of rubber, resins and related preparations	9a, 9b, 9c, 18, 19, 20, 24, 32, 33	X			X	10, 11	10, 3, 5, 6, 8b, 9, 13, 14, 21, 24	10	2, 3, 6d, 1		
27	Production of polymermatrices, plastics and related preparations	19, 20, 32, 33	X			X	10, 12	2, 3, 5, 6, 8b, 9, 10, 13, 14, 21, 24	1, 2, 3, 13	1, 3		
28	Additive / component for the production of Sealants / Adhesives / Mastics	1, 9a, 14, 19, 20, 24, 32	X			X	10, 8	3, 5, 8b, 9, 10, 11, 13, 14, 20, 21, 24	1, 2, 7, 11	1, 2, 7, 6a, 8c, 10		

Number (ES)	Exposure Scenario Title	Chemical product category [PC]	Life cycle stage covered by ES					Sector of use category [SU]	Process category [PROC]	Article Category [AC]	category [ENC]	
			Manufacture	Formulation	End use							Service life
					Industrial	Professional	Consumer					
30	Additive / component for the production of Lubricants / Grease / Metal working fluids	14, 24, 25, 32	X				X	10, 18	3, 4, 5, 8b, 9, 10, 13	1, 2, 7	1, 2, 7	6a, 9a,
32	Additive / component for the production of Polishes / wax blends	9c, 9b, 9a, 14, 25, 31	X				X	9, 10, 18	3, 4, 5, 7, 8b, 9, 10, 11, 13, 19	1, 2, 7	1, 2, 7	6a,
34	Use of ZnCl <sub>2</sub> - containing catalysts	2, 9a, 9b, 9c, 19, 20, 40	X				X	8, 9, 10	1, 2, 3, 5, 8b, 9, 14			1, 5
35	Additive component for production of de-icing products	4, 20, 35	X				X	8, 9	3, 5, 8b, 9			2, 5
37	Additive for the formulation of animal feedstuffs	29, 20	X				X	4	3, 5, 8b, 9			2
38	Additive for the formulation of biocidal products	37, 8	X				X	9, 10	5, 8b, 9			
39	Additive for the formulation of cleaning products	8, 35, 37	X				X	10, 9	5, 8b, 9			2,
41	Additive for the formulation of fertilizers	9b, 12, 20, 21	X				X	8, 1, 10	1, 2, 3, 4, 5, 8b, 9, 13			2, 3, 11
43	Additive in the formulation of cosmetics	28, 35, 39	X				X	10	1, 2, 3, 5, 8b, 9, 13, 14, 15			
45	Additive in the formulation of pharma / veterinary products	20, 21, 29	X				X	10, 20, 9, 0.Nace C21.1	1, 2, 3, 5, 8b, 9, 13, 14, 15			2, 5
12	Use of zinc chloride based fluxing agents before welding/soldering processes	7, 25, 38	X				X	16, 17, 18, 0.Nace C23.9.9	2, 4, 8b, 13, 25			1, 2, 3, 7 3, 5, 10,
29	Use of ZnCl <sub>2</sub> -containing Sealants / Adhesives / Mastics	9a, 9b, 9c, 1, 14, 19, 20, 24, 32	X				X	5, 6a, 6b, 11, 12, 13, 15, 19	7, 8a, 8b, 9, 10, 11, 13, 14, 17, 19, 21			7, 1, 2, 8a, 11

Number (ES)	Exposure Scenario Title	Chemical product category [PC]	Life cycle stage covered by ES						Sector of use category [SU]	Process category [PROC]	Article Category [AC]	category [LRC]
			Manufacture	Formulation	End use			Service life				
					Industrial	Professional	Consumer					
31	Use of ZnCl2-containing Lubricants / Grease / Metal working fluids	24, 14, 25, 32			X	X	X	17, 18	7, 8a, 8b, 9, 10, 11, 13, 14, 17, 19, 21	11, 1, 2, 7	8a, 8b	
33	Use of ZnCl2-containing Polishes / wax blends	9a, 9b, 9c, 14, 25, 31			X	X	X	18, 9	7, 8a, 8b, 9, 10, 11, 13, 14, 19, 21	7, 1, 11, 2	8a, 8b	
36	Use of ZnCl2-containing de-icing products	4, 20, 35			X	X	X	18, 9	7, 8a, 8b, 9, 10, 11, 13, 14, 19, 21		8a	
40	Use of ZnCl2-containing cleaning products	8, 35, 39			X	X	X	9	8a, 8b, 9, 10, 11, 13		8a, 8b	
42	Use of ZnCl2-containing fertilizer's formulations	9b, 12, 20			X	X	X	1, 9	2, 7, 8a, 8b, 9, 10, 11, 13, 19, 26		8a, 8b, 8e	
44	Use of cosmetics	28, 35, 39			X	X	X	9	8a, 8b, 9, 10, 11		8a, 8b	
46	Use of of Pharma / veterinary products	20, 21, 29			X	X	X	20	8a, 8b, 9, 10, 11		8a, 8b	

Number (ES)	Exposure Scenario Title	Chemical product category [PC]	Life cycle stage covered by ES						Sector of use category [SU]	Process category [PROC]	Article Category [AC]	Category [LRC]
			Manufacture	Formulation	End use			Service life				
					Industrial	Professional	Consumer					
1	Zinc chloride recovery	19, 20, 21	X					X	8, 9	2, 3, 5, 8b, 9, 26		
2	Zinc chloride production and refining	20, 21	X					X	8, 9	2, 3, 5, 8b, 9, 26		
6	Production of inorganic zinc compounds	19, 20, 21	X					X	8, 9, 10	2, 3, 8b, 9, 15	1,	
7	Electroplating	7, 14	X					X	15, 17, 0.Nace C25.6.1	13, 21	2, 7	
8	Electroplating	7, 14	X					X	0.Nace C25.6.1, 15, 17	3, 8b, 21	2, 7	
9	Zinc production by electrowinning	7	X					X	0.NACE C24.4.3, 14	2, 8b, 22, 26		
10	Production of Zinc chloride based fluxing agents	19, 20, 21	X					X	8, 9, 10	2, 3, 5, 8b, 9, 15	1, 2	
11	steel surface treatment prior to hot-dip galvanizing	14, 38	X					X	8, 14, 15, 18, 19, 0.Nace C23.9.9	2, 4, 8b, 13, 25	1, 2, 3, 7, 5, 8	
13	Laboratory reagents	19, 21, 28, 39	X					X	10, 24	1, 2, 3, 4, 5, 8b, 9, 15	1, 2, 6b,	
14	Catalytic agent	19, 20	X					X	9, 10	4, 5, 8b, 9, 15	4	
15	Zinc production by pyrometallurgy	7	X					X	14, 0.NACE C24.4.3	2, 8b, 23, 26		
16	Production of organic zinc compounds	19, 20, 21, 24, 29, 39	X					X	9, 10	1, 2, 3, 4, 8b, 9, 15	1,	
17	Production of organic pigments	9a, 9b, 9c	X					X	8, 9, 10, 13	1, 2, 3, 4, 5, 8b, 9, 22	1	

Number (ES)	Exposure Scenario Title	Chemical product category [PC]	Life cycle stage covered by ES					Sector of use category [SU]	Process category [PROC]	Article Category [AC]	Category [ENC]	
			Manufacture	Formulation	End use							Service life
					Industrial	Professional	Consumer					
18	Production of coatings, paints, inks, enamels, varnishes	1, 9a, 9b, 9c, 14, 15, 18, 26, 32	X			X	5, 8, 9, 10, 11, 12, 13, 14	1, 2, 3, 4, 5, 8b, 9		1, 2,		
19	Formulation of abrasive material for tools	9b, 14, 15, 20	X			X	8, 9, 10, 13, 14, 18	1, 2, 3, 4, 5, 8b, 9, 14, 22, 26		1, 11,		
20	Component for paper coating or treatment for paper products	9a, 15, 18, 21, 35, 20, 23, 34	X			X	6b, 7, 8, 9, 10	3, 4, 5, 6, 8b, 9, 13		2,		
21	Use of ZnCl2 containing paper coatings	1, 9a, 9b, 9c, 15, 18	X		X	X	6b, 10	4, 5, 6, 8b, 9, 10, 13, 19	0	8a, 8		
22	Textile and leather coating treatment	9a, 15, 19, 20, 21, 23, 34, 35	X			X	5, 8, 9, 10	3, 4, 5, 6, 8b, 9, 13	5, 6	2		
23	Use of ZnCl2 containing coatings for textile and leather	15, 23, 34	X		X	X	5, 10	4, 5, 6, 19, 8b, 9, 13	5, 6	8a, 8		
24	Additive in the manufacturing of electricelectronic components	20, 33	X			X	10, 13, 16, 0.NACE C26.1.1:	3, 5, 8b, 9, 14, 22	2, 4	3		
25	Batteries /fuel cells	14, 19, 20, 21	X			X	16, 0.NACE-CodeC2	3, 5, 13, 14	3	3		
26	Component for production of rubber, resins and related preparations	9a, 9b, 9c, 18, 19, 20, 24, 32, 33	X			X	10, 11	10, 3, 5, 6, 8b, 9, 13, 14, 21, 24	10	2, 3, 6d, 1		
27	Production of polymermatrices, plastics and related preparations	19, 20, 32, 33	X			X	10, 12	2, 3, 5, 6, 8b, 9, 10, 13, 14, 21, 24	1, 2, 3, 13	1, 3		
28	Additive / component for the production of Sealants / Adhesives / Mastics	1, 9a, 14, 19, 20, 24, 32	X			X	10, 8	3, 5, 8b, 9, 10, 11, 13, 14, 20, 21, 24	1, 2, 7, 11	1, 2, 7, 6a, 8c, 10		



Number (ES)	Exposure Scenario Title	Chemical product category [PC]	Life cycle stage covered by ES					Sector of use category [SU]	Process category [PROC]	Article Category [AC]	category [ENC]	
			Manufacture	Formulation	End use							Service life
					Industrial	Professional	Consumer					
30	Additive / component for the production of Lubricants / Grease / Metal working fluids	14, 24, 25, 32	X				X	10, 18	3, 4, 5, 8b, 9, 10, 13	1, 2, 7	1, 2, 7	6a, 9a,
32	Additive / component for the production of Polishes / wax blends	9c, 9b, 9a, 14, 25, 31	X				X	9, 10, 18	3, 4, 5, 7, 8b, 9, 10, 11, 13, 19	1, 2, 7	1, 2, 7	6a,
34	Use of ZnCl <sub>2</sub> - containing catalysts	2, 9a, 9b, 9c, 19, 20, 40	X				X	8, 9, 10	1, 2, 3, 5, 8b, 9, 14			1, 5
35	Additive component for production of de-icing products	4, 20, 35	X				X	8, 9	3, 5, 8b, 9			2, 5
37	Additive for the formulation of animal feedstuffs	29, 20	X				X	4	3, 5, 8b, 9			2
38	Additive for the formulation of biocidal products	37, 8	X				X	9, 10	5, 8b, 9			
39	Additive for the formulation of cleaning products	8, 35, 37	X				X	10, 9	5, 8b, 9			2,
41	Additive for the formulation of fertilizers	9b, 12, 20, 21	X				X	8, 1, 10	1, 2, 3, 4, 5, 8b, 9, 13			2, 3, 11
43	Additive in the formulation of cosmetics	28, 35, 39	X				X	10	1, 2, 3, 5, 8b, 9, 13, 14, 15			
45	Additive in the formulation of pharma / veterinary products	20, 21, 29	X				X	10, 20, 9, 0.Nace C21.1	1, 2, 3, 5, 8b, 9, 13, 14, 15			2, 5
12	Use of zinc chloride based fluxing agents before welding/soldering processes	7, 25, 38	X				X	16, 17, 18, 0.Nace C23.9.9	2, 4, 8b, 13, 25			1, 2, 3, 7, 3, 5, 10,
29	Use of ZnCl <sub>2</sub> -containing Sealants / Adhesives / Mastics	9a, 9b, 9c, 1, 14, 19, 20, 24, 32	X				X	5, 6a, 6b, 11, 12, 13, 15, 19	7, 8a, 8b, 9, 10, 11, 13, 14, 17, 19, 21			7, 1, 2, 8a, 11

Number (ES)	Exposure Scenario Title	Chemical product category [PC]	Life cycle stage covered by ES						Sector of use category [SU]	Process category [PROC]	Article Category [AC]	category [LRC]
			Manufacture	Formulation	End use			Service life				
					Industrial	Professional	Consumer					
31	Use of ZnCl2-containing Lubricants / Grease / Metal working fluids	24, 14, 25, 32			X	X	X	17, 18	7, 8a, 8b, 9, 10, 11, 13, 14, 17, 19, 21	11, 1, 2, 7	8a, 8b, 11, 1, 2, 7	
33	Use of ZnCl2-containing Polishes / wax blends	9a, 9b, 9c, 14, 25, 31			X	X	X	18, 9	7, 8a, 8b, 9, 10, 11, 13, 14, 19, 21	7, 1, 11, 2	8a, 8b, 7, 1, 11, 2	
36	Use of ZnCl2-containing de-icing products	4, 20, 35			X	X	X	18, 9	7, 8a, 8b, 9, 10, 11, 13, 14, 19, 21		8a, 8b, 9, 10, 11, 13, 14, 19, 21	
40	Use of ZnCl2-containing cleaning products	8, 35, 39			X	X	X	9	8a, 8b, 9, 10, 11, 13		8a, 8b, 9, 10, 11, 13	
42	Use of ZnCl2-containing fertilizer's formulations	9b, 12, 20			X	X	X	1, 9	2, 7, 8a, 8b, 9, 10, 11, 13, 19, 26		8a, 8b, 9, 10, 11, 13, 19, 26	
44	Use of cosmetics	28, 35, 39			X	X	X	9	8a, 8b, 9, 10, 11		8a, 8b, 9, 10, 11	
46	Use of of Pharma / veterinary products	20, 21, 29			X	X	X	20	8a, 8b, 9, 10, 11		8a, 8b, 9, 10, 11	