Safety data sheet

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

· 1.1 Product identifier

· **Product name:** EM-Tec AG42 Conductive Silver Cement
· **Other Means of Identification:** 15-002141 & 15-002142

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

· **Application of the substance / the mixture** Electrically conductive coating and EMI/RFI shield.
· **Uses advised against** Not Applicable

· 1.3 Details of the supplier of the safety data sheet

· **Manufacturer/Supplier:**

Micro to Nano
· Tappersweg 91
· 2031 ET, Haarlem
· The Netherlands
· **Further information obtainable from:** www.microtonano.com

· 1.4 Emergency telephone number:

National Emergency Telephone: 112

SECTION 2: Hazards identification

· 2.1 Classification of the substance or mixture

· **Classification according to Regulation (EC) No 1272/2008**

Flam. Liq. 2	H225	Highly flammable liquid and vapour.
Skin Irrit. 2	H315	Causes skin irritation.
Eye Irrit. 2	H319	Causes serious eye irritation.
Repr. 2	H361d	Suspected of damaging the unborn child.
STOT SE 3	H336	May cause drowsiness or dizziness.
STOT RE 2	H373	May cause damage to organs through prolonged or repeated exposure.

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Aquatic Acute 1	H400	Very toxic to aquatic life.
Aquatic Chronic 1	H410	Very toxic to aquatic life with long lasting effects.

· **2.2 Label elements**

· **Labelling according to Regulation (EC) No 1272/2008**

The product is classified and labelled according to the GB CLP regulation.

· **Hazard pictograms**

GHS02 GHS07 GHS08 GHS09

· **Signal word** Danger

· **Hazard-determining components of labelling:**
toluene
acetone
isobutyl acetate
heptan-2-one

· **Hazard statements**
H225 Highly flammable liquid and vapour.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H361d Suspected of damaging the unborn child.
H336 May cause drowsiness or dizziness.
H373 May cause damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

· **Precautionary statements**
P102 Keep out of reach of children.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271 Use only outdoors or in a well-ventilated area.
P370+P378 In case of fire: Use CO2, powder or water spray to extinguish.
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents and container in accordance with local, regional, and national regulations.

· **Additional information:**
EUH066 Repeated exposure may cause skin dryness or cracking.

· **2.3 Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Determination of endocrine-disrupting properties** Endocrine Disruptor substance 0.1% = none

SECTION 3: Composition/information on ingredients

· **3.2 Mixtures**

· **Description:** Mixture of substances listed below with nonhazardous additions.

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· **Dangerous components:**		
CAS: 7440-22-4 EINECS: 231-131-3	Silver (Powder) Aquatic Acute 1, H400 (M=10); Aquatic Chronic 1, H410 (M=10)	62.0%
CAS: 108-88-3 EINECS: 203-625-9 Index number: 601-021-00-3	toluene Flam. Liq. 2, H225; Repr. 2, H361d; STOT RE 2, H373; Asp. Tox. 1, H304; Skin Irrit. 2, H315; STOT SE 3, H336	10.0%
CAS: 67-64-1 EINECS: 200-662-2 Index number: 606-001-00-8	acetone Flam. Liq. 2, H225; Eye Irrit. 2, H319; STOT SE 3, H336, EUH066	6.0%
CAS: 64-17-5 EINECS: 200-578-6 Index number: 603-002-00-5	ethanol Flam. Liq. 2, H225; Skin Irrit. 2, H315	3.0%
CAS: 110-19-0 EINECS: 203-745-1 Index number: 607-026-00-7	isobutyl acetate Flam. Liq. 2, H225, EUH066	3.0%
CAS: 110-43-0 EINECS: 203-767-1 Index number: 606-024-00-3	heptan-2-one Flam. Liq. 3, H226; Acute Tox. 4, H302; Acute Tox. 4, H332	3.0%
CAS: 141-78-6 EINECS: 205-500-4 Index number: 607-022-00-5	ethyl acetate Flam. Liq. 2, H225; Eye Irrit. 2, H319; STOT SE 3, H336, EUH066	1.0%

· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

· 4.1 Description of first aid measures

· **After inhalation:**
Remove person to fresh air and keep comfortable for breathing.
If feeling unwell: Call a POISON CENTRE or doctor.

· **After skin contact:**
Wash with plenty water.
If skin irritation or rash occurs: Get medical advice or attention.
Take off contaminated clothing and wash it before reuse.

· **After eye contact:**
Rinse cautiously with water for 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice or attention.

· **After swallowing:**
A person vomiting while laying on their back should be turned onto their side.
Rinse mouth.
Do NOT induce vomiting.
If symptoms persist consult doctor.
If exposed or concerned: Get medical advice or attention.

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

See section 11 for additional information.

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· **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

SECTION 5: Firefighting measures

· **5.1 Extinguishing media**
· **Suitable extinguishing agents:**
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet

· **5.2 Special hazards arising from the substance or mixture**
The flu-like symptoms of metal fever may be delayed, occurring 4 to 12 hours after exposure.
Prevent fire-fighting wash from entering waterway or sewer system.
Inhalation of metal fumes may cause metal fever and irritate the respiratory tract.
· **Hazardous combustion products:**
Carbon Oxides (COx)
toxic metal fumes

· **5.3 Advice for firefighters**
· **Protective equipment:** Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

SECTION 6: Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**
Ensure adequate ventilation
Remove or keep away all sources of extreme heat or open flames.
Do not breathe mist, spray or vapors.

· **6.2 Environmental precautions:**
Avoid release to the environment.
Do not allow to enter sewers/ surface or ground water.

· **6.3 Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Collect liquid in a sealable, chemical-resistant container.
Wash residue with a paper towel and place dirty towels in container.
Use soap and water to remove the last traces of residue.

· **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

· **7.1 Precautions for safe handling**
Wear protective gloves and eye protection.
Wash hands and exposed skin thoroughly after handling.
Take off contaminated clothing and wash it before reuse.
Collect spillage.

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Use only outdoors or in a well-ventilated area.
Obtain, read and follow all safety instructions before use.
Do not breathe mist, vapours, spray.

· **Information about fire - and explosion protection:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Use explosion-proof apparatus / fittings and spark-proof tools.
Ground and bond container and receiving equipment.

· **7.2 Conditions for safe storage, including any incompatibilities**

· **Storage:**

· **Requirements to be met by storerooms and receptacles:**
Store in a well-ventilated place. Keep cool.

· **Information about storage in one common storage facility:** Not required.

· **Further information about storage conditions:**
Keep container tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
Store locked up.

· **7.3 Specific end use(s)** See section 1.2

SECTION 8: Exposure controls/personal protection

· **8.1 Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**	
108-88-3 toluene	
WEL	Short-term value: 384 mg/m³, 100 ppm Long-term value: 191 mg/m³, 50 ppm Sk
67-64-1 acetone	
WEL	Short-term value: 3620 mg/m³, 1500 ppm Long-term value: 1210 mg/m³, 500 ppm
64-17-5 ethanol	
WEL	Long-term value: 1920 mg/m³, 1000 ppm
110-19-0 isobutyl acetate	
WEL	Short-term value: 903 mg/m³, 187 ppm Long-term value: 724 mg/m³, 150 ppm
110-43-0 heptan-2-one	
WEL	Short-term value: 475 mg/m³, 100 ppm Long-term value: 237 mg/m³, 50 ppm Sk
141-78-6 ethyl acetate	
WEL	Short-term value: 1468 mg/m³, 400 ppm Long-term value: 734 mg/m³, 200 ppm

· **Additional information:**
The lists valid during the making were used as basis.
Refer to the national or regional occupational exposure limit regulation for abbreviations and acronyms.

· **8.2 Exposure controls**

· **Appropriate engineering controls** No further data; see section 7.

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· **Individual protection measures, such as personal protective equipment**

· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.

· **Respiratory protection:**
Advice should be sought from respiratory protection specialists.
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
If the product is heated or worker has a known allergic reaction, consider using a full mask with organic vapor cartridge or with an independent air supply.

· **Hand protection**

Protective gloves: EN374

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye/face protection**

Safety glasses or tightly sealed goggles: EN 166

SECTION 9: Physical and chemical properties

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

· **Physical state**	Liquid
· **Form:**	Low viscosity
· **Colour:**	Silver Grey
· **Odour:**	Sweetish
· **Odour threshold:**	Not available
· **Boiling point or initial boiling point and boiling range**	56 °C
· **Flammability**	Highly flammable.
· **Lower and upper explosion limit**	
· **Lower:**	1.8 Vol %
· **Upper:**	13 Vol %
· **Flash point:**	-17 °C (67-64-1 acetone)

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· **Auto-ignition temperature:**	363 °C
· **Solubility**	
· **water:**	Not miscible or difficult to mix.
· **Vapour pressure at 20 °C:**	29 hPa (108-88-3 toluene)
· **Vapour pressure at 50 °C:**	124 hPa
· **Relative density at 25 °C:**	2.1
· **Vapour density (air=1):**	Not available
· **Particle characteristics**	Not applicable.

· **9.2 Other information**

· **9.2.1 Information with regard to physical hazard classes**	
· **Flammable liquids**	Highly flammable liquid and vapour.
· **9.2.2 Other safety characteristics**	
· **Evaporation rate**	Not available
· **Ignition temperature:**	Product is not selfigniting.
· **Explosive properties:**	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
· **Solvent content:**	
· **Organic solvents:**	26.00 %
· **VOC (EC)**	26.00 %

SECTION 10: Stability and reactivity

· **10.1 Reactivity** No further relevant information available.

· **10.2 Chemical stability** Chemically stable at normal temperatures and pressures.
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.

· **10.3 Possibility of hazardous reactions** No dangerous reactions known.

· **10.4 Conditions to avoid**
Avoid open flames, excessive heat, sparks, ignition sources, and incompatible substances.

· **10.5 Incompatible materials:**
Strong bases
Strong oxidizing agents
Phosphorous oxychloride
Strong acids

· **10.6 Hazardous decomposition products:**
Hazardous combustion products: see section 5.
No dangerous decomposition products known.

SECTION 11: Toxicological information

· **11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**
· **Acute toxicity** Based on available data, the classification criteria are not met.

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· **LD/LC50 values relevant for classification:**

ATE (Acute Toxicity Estimates)		
Oral	LD50	55,667 mg/kg (rat)
Inhalative	LC50/4 h	>557 mg/kg (rabbit)

7440-22-4 Silver (Powder)		
Oral	LD50	>2,000 mg/kg (rat)
Dermal	LD50	>2,000 mg/kg (rat)
108-88-3 toluene		
Oral	LD50	5,000 mg/kg (rat)
Dermal	LD50	12,124 mg/kg (rabbit)
Inhalative	LC50/4 h	5,320 mg/L (mouse)
67-64-1 acetone		
Oral	LD50	5,800 mg/kg (rat)
Dermal	LD50	>7,426 mg/kg (rabbit)
Inhalative	LC50/ 3 h	132 mg/L (rat)
64-17-5 ethanol		
Oral	LD50	7,060 mg/kg (rat)
Inhalative	LC50/4 h	20,000 mg/L (rat)
110-19-0 isobutyl acetate		
Oral	LD50	13,400 mg/kg (rat)
110-43-0 heptan-2-one		
Oral	LD50	1,670 mg/kg (rat)
Dermal	LD50	12,600 µL/kg (rabbit)
Inhalative	LC50/4 h	>16.7 mg/kg (rabbit)
141-78-6 ethyl acetate		
Oral	LD50	5,620 mg/kg (rabbit)
Inhalative	LC50/4 h	1,600 mg/L (rat)

· **Primary irritant effect:**
· **Skin corrosion/irritation** Causes skin irritation.
· **Serious eye damage/irritation** Causes serious eye irritation.
· **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
· **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
· **Carcinogenicity** Based on available data, the classification criteria are not met.
· **Reproductive toxicity** Suspected of damaging the unborn child.
· **STOT-single exposure** May cause drowsiness or dizziness.
· **STOT-repeated exposure** May cause damage to organs through prolonged or repeated exposure.
· **Aspiration hazard** Based on available data, the classification criteria are not met.
· **Summary of Effects and Symptoms by Routes of Exposure**
· **Eyes:**
redness, serious irritation
tearing of the eyes
· **Skin:**
dry skin
redness, irritation
· **Inhalation:**
dizziness or drowsiness
cough

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headache
nausea
Extreme exposure may cause unconsciousness.

· **Swallowed:**
nausea
sore throat
diarrhea

· **Additional toxicological information:**

· **Delayed and immediate effects as well as chronic effects from short and long-term exposure**
Prolonged or repeated exposure may defat skin and cause skin dryness and cracking, and local redness and discomfort.
Exposure to silver powder may also cause argyria, an irreversible blue-grey discoloration of the skin.
Chronic inhalation exposure may affect the central nervous system and lead to hearing loss with co-exposure to loud noises.

· **11.2 Information on other hazards**

· **Endocrine disrupting properties**
None of the ingredients is listed.

SECTION 12: Ecological information

· **12.1 Toxicity**

· **Aquatic toxicity:**
Very toxic to aquatic life with long lasting effect.
Avoid release to the environment.
Collect spillage.

67-64-1 acetone	
EC50/ 48 h	13,500 mg/L (daphnia)
LC50 96h	5,540 mg/L (trout)
64-17-5 ethanol	
LC50	>1,000 mg/L (fish) Biodegradable
110-43-0 heptan-2-one	
EC50/ 48 h	>100 mg/L (daphnia)
LC50 96h	131 mg/L (minnow)

· **12.2 Persistence and degradability** No further relevant information available.

· **12.3 Bioaccumulative potential** No further relevant information available.

· **12.4 Mobility in soil** No further relevant information available.

· **12.5 Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **12.6 Endocrine disrupting properties**
The product does not contain substances with endocrine disrupting properties.

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· **12.7 Other adverse effects**
· **Additional ecological information:**
· **General notes:**
Water hazard class 3 (German Regulation) (Self-assessment): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.

SECTION 13: Disposal considerations

· **13.1 Waste treatment methods**
· **Recommendation** This material and its container must be disposed of as hazardous waste.

· **European waste catalogue**	
HP3	Flammable
HP4	Irritant - skin irritation and eye damage
HP5	Specific Target Organ Toxicity (STOT)/Aspiration Toxicity
HP10	Toxic for reproduction
HP14	Ecotoxic

· **Uncleaned packaging:**
· **Recommendation:**
Containers may still present a chemical hazard/ danger when empty.
Dispose of contents in accordance with all local, regional, national, and international regulations.
Where possible retain label warnings and SDS and observe all notices pertaining to the product.

SECTION 14: Transport information

· **14.1 UN number or ID number**
· **ADR, IMDG, IATA** UN1263

· **14.2 UN proper shipping name**
· **ADR, IMDG** PAINT
· **IATA** Paint

· **14.3 Transport hazard class(es)**
· **ADR, IMDG, IATA**

· **Class** 3 Flammable liquids.
· **Label** 3

· **14.4 Packing group**
· **ADR, IMDG, IATA** II

· **14.5 Environmental hazards:** Product contains environmentally hazardous substances: Silver (Powder)

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· **Marine pollutant:**	MARINE POLLUTANT
· **Special marking (ADR):**	ENVIRONMENTALLY HAZARDOUS
· **Special marking (IATA):**	ENVIRONMENTALLY HAZARDOUS

· **14.6 Special precautions for user** Not applicable.
· **Hazard identification number (Kemler code):** 33
· **EMS Number:** F-E,S-E
· **Stowage Category** B

· **14.7 Maritime transport in bulk according to IMO instruments** Not applicable.

· **Transport/Additional information:**

Limited Quantity

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· **ADR**	
· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **Transport category**	2
· **Tunnel restriction code**	D/E
· **IMDG**	
· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1263 PAINT, 3, II

SECTION 15: Regulatory information

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

· **Poisons Act**

· **Regulated explosives precursors (Part 1)**

None of the ingredients is listed.

· **Regulated poisons (Part 2)**

None of the ingredients is listed.

· **Reportable explosives precursors (Part 3)**

67-64-1	acetone	Listed

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· **Reportable poisons (Part 4)**
None of the ingredients is listed.

· **Directive 2012/18/EU**
· **Named dangerous substances - ANNEX I** None of the ingredients is listed.
· **Seveso category**
E1 Hazardous to the Aquatic Environment
P5c FLAMMABLE LIQUIDS
· **Qualifying quantity (tonnes) for the application of lower-tier requirements** 100 t
· **Qualifying quantity (tonnes) for the application of upper-tier requirements** 200 t
· **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3, 48

· **DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II**
None of the ingredients is listed.

· **Annex I - RESTRICTED EXPLOSIVES PRECURSORS (Upper limit value for the purpose of licensing under Article 5(3))**
None of the ingredients is listed.

· **Annex II - REPORTABLE EXPLOSIVES PRECURSORS**	
67-64-1	acetone

· **Regulation (EC) No 273/2004 on drug precursors**		
108-88-3	toluene	3
67-64-1	acetone	3

· **Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors**		
108-88-3	toluene	3
67-64-1	acetone	3

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**
H225 Highly flammable liquid and vapour.
H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H336 May cause drowsiness or dizziness.
H361d Suspected of damaging the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.
EUH066 Repeated exposure may cause skin dryness or cracking.

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· **Classification according to Regulation (EC) No 1272/2008**	
Flammable liquids	On basis of test data
Skin corrosion/irritation Serious eye damage/irritation Reproductive toxicity Specific target organ toxicity (single exposure) Specific target organ toxicity (repeated exposure) Hazardous to the aquatic environment - short-term (acute) aquatic hazard Hazardous to the aquatic environment - long-term (chronic) aquatic hazard	The classification of the mixture is generally based on the calculation method using substance data according to Regulation (EC) No 1272/2008.

· **Department issuing SDS:** Regulatory department
· **Contact:** info@microtonano.com
· **Version number of previous version:** 1.00
· **Abbreviations and acronyms:**
ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
ATE: Acute toxicity estimate values
Flam. Liq. 2: Flammable liquids – Category 2
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
Repr. 2: Reproductive toxicity – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2
Asp. Tox. 1: Aspiration hazard – Category 1
Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1
Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1