

Product name: EM-Tec AG31 Silver filled epoxy, part B
Document Nr.: SDS00115002431B-01

Date: February 9th 2022
Version: 2.0

Section 1: Identification of the substance or mixture and the company

1.1. Product Identifier

EM-Tec AG31 fast cure, high conductivity silver filled epoxy

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

Silver filled electrically conductive epoxy hardener for use with resin.
Making electrically conductive bonds.
Uses advised against: Not available

1.3. Details of the supplier of the Safety Data Sheet

Tappersweg 91
2031ET Haarlem
Netherlands
Tel: +31(0)85-2013155
E: info@microtonano.com

1.4 Emergency telephone number

112 (NLD) or your national emergency telephone number for chemical spills, leaks, fires, exposures or accidents

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Physical:	Low flammability
Health:	Corrosive to eyes category 1 Skin corrosion/irritation category 1 Reproductive toxicity category 2
Environment:	Chronic aquatic hazard category 1 Acute aquatic hazard category 1
Other hazards:	None

Classification according to Regulation EC Nr. 1272/2008

Xi: Irritant
Xn: Harmful
C: Corrosive



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Health:	R38: Irritating to skin R41: Risk of serious damage to eyes R61: May cause harm to the unborn child
Physical	Not classified
Environment:	R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
Other hazards:	Not classified

2.2 Labeling elements

Labelling accordance to Regulation EC Nr. 1272/2008

Hazard pictogramm(s):



Signal word: **Danger**

Hazard statement(s):
H314: Causes severe skin burns and eye damage
H317: May cause an allergic skin reaction
H361: Suspected of damaging fertility or the unborn child
H410: Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention:
P102: Keep out of reach of children
P201+P202: Obtain special instructions before use. Do not handle until safety precautions have read and understood
P260: Do not breath fumes/vapours
P270: Do not eat, drink or smoke when using this product
P 272: Contaminated work clothing should not be allowed out of the workplace
P 273: Avoid release to the environment
P280: Wear protective gloves/protective clothing/eye protection/face protection

Response:

P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes
Remove contact lenses, if present and easy to do so. Continue rinsing
P301+P330+P331: If swallowed: Rinse mouth. Do not induce vomiting
P303+P361+P353: If on skin (or hair): Take off immediately all contaminated clothing.
Rinse skin with water/shower.
P333+P313: If skin irritation or a rash occurs: Get medical attention
P304+P340: If inhaled: Remove person to fresh air and keep comfortable for



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breathing
P363: Wash contaminated clothing before reuse
P308+P313: For all routed of exposure: If exposed or concerned: Get medical attention
P391: Collect spillage
Storage: P405: Store locked up
Disposal: P501: Dispose of contents/container in accordance to local/regional/international regulations
Supplemental hazard info: none

2.3 Other hazards

Argyria warning: Long term ingestion or inhalation of silver dust can lead to an irreversible blue-grey discoloration of the skin

Section 3: Composition / information on components

3.1. Substances

Not applicable

3.2 Mixtures

Component	CAS Nr.	WT%
Silver flakes (<1mm) - Ag	7440-22-4	67
4-nonyl phenol, branched	84852-15-3	22
1-piperazineethanamine	140-31-8	7
Diethylene triamine, reaction product with diglycidyl ether of Bisphenol A	68411-71-2	1
Diethylene triamine	111-40-0	1
4,4'-isopropylidenediphenol	80-05-7	1

(* Explanation notes: see section 16)

Section 4: First aid measures

4.1. Description of first aid measures

Contact with eyes: Rinse cautiously with water for several minutes. If possible, remove contact lenses. Continue rinsing.



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Contact with skin:	Seek medical attention if irritation persists. Wash with water and soap.
Inhalation:	Seek medical attention if irritation persists. Fresh air, keep warm and at rest.
Ingestion:	Seek medical attention if ill effects occur If swallowed, do not induce vomiting Seek immediate medical advice If vomiting appears imminent or occurs hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus. Never give liquid to a person with reduced awareness Give water to rinse out mouth, then provide water slowly as much as casually can comfortably drink Avoid giving milk or oils Avoid giving alcohol

4.2. Important symptoms and effects, either immediate or delayed

Eye contact:	Corrosive to eyes Symptoms: redness, severe irritation, pain, burns Immediately call a poison center/doctor
Skin contact:	Corrosive to skin Symptoms: redness, severe irritation, rash (allergic contact dermatitis), pains, burns, blistering Immediately call a poison center/doctor
Inhalation:	Corrosive to the respiratory tract Cough, severe irritation or burns Immediately call a poison center/doctor
Ingestion:	Corrosive to digestive tract Symptoms: severe irritation, burns to mouth, throat, stomach Immediately call a poison center/doctor

4.3. Indication of any immediate medical attention and special treatment

General advise:	If you feel unwell, seek medical advice; show product label if possible If symptoms persist, always call a doctor
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Section 5: Firefighting Measures

5.1. Extinguishing media

Use dry chemical, CO₂, chemical foam or water spray. Use water spray to cool containers.

5.2 Special hazards arising from the substance or mixture



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Not flammable or combustible, but will burn if involved in a fire.
Produces carbon oxides (CO, CO₂), irritating smoke and toxic fumes in fires
Inhalation of toxic smoke or fumes may have delayed effects. Exposed person may need to be put under surveillance for 4-12 hrs.

5.3 Advice to firefighters

Fight fire from a safe distance, with adequate cover
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
Keep away from extreme heat or open flames
Wear suitable protective clothing including eye/face protection

6.2 Environmental precautions

Avoid release to the environment
Do not allow to enter public sewers and waterways

6.3 Methods and material for containment and clean up

Clean up spills immediately
Collect spillage and wipe residue with a paper towel wetted with alcohol.
Collect spillage and dirty towels in a sealable waste container made of plastic or steel
Avoid containers with copper, aluminium, zinc or galvanised surfaces since the waste material can slowly oxidise these
Wash spill area with soap and water to remove last traces of residue

6.4 Reference to other sections

For further information see section 8

Section 7: Handling and storage

7.1. Precautions for safe handling

Avoid breathing dust/fumes/mist/vapours
Ensure adequate ventilation



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Avoid contact with skin and eyes
Wash thoroughly after use
Wear protective gloves/protective clothing/eye protection

7.2 Conditions for safe storage, including any incompatibilities

Store locked up in a cool dry place
Keep out of reach of children

7.3 Specific end uses(s)

Silver filled electrically conductive epoxy hardener for use with resin.
Making electrically conductive bonds.

Section 8: Exposure control and personal protection

8.1. Control parameters

Exposure limits

Occupational exposure limits (OEL)

Ingedrient	TWA	STEL	Peak	Notes
Silver flakes (<1mm) - Ag	0.1mg/m ³	Not available	Not available	Not available
Diethylene triamine	1 ppm	Not available	Not available	Not available
EM-Tec AG31 Silver filled epoxy, part B	Not available	Not available	Not available	Not available

8.2 Exposure controls

Control procedures: Ensure adequate ventilation
Personal protection: Take precautions to avoid contact with eyes and skin when handling the products
Inhalation: In case of insufficient ventilation, wear suitable respiratory equipment:
Air purifying respirator with organic gas/vapour cartridge (type A)
Hands and skin: Wear suitable gloves against chemicals; recommended gloves: Nitrile
Eyes: Wear safety goggles or full face protection

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties



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Appearance/physical state:	Solid, paste
Colour:	Silver grey
Odour:	Amine-like
pH	Not available
Boiling point/range:	Noy available
Flash point:	>93°C (closed cup)
Evaporation rate:	Not available
Explosion limits: upper limit:	Not available
 lower limit:	Not available
Vapour pressure:	Not available
Specific gravity:	2.4 g/cm ³ @ 25°C
Solubility in water:	Insoluble
Auto-ignition:	Not available
Viscosity @40°C :	>>20.5 mm ² /s

9.2 Other information

VOC: Not available

Section 10: Stability and reactivity

10.1. Reactivity

Reacts exothermically with epoxide groups. May slowly attack metals such as aluminium, zinc, copper and their alloys.

10.2 Chemical stability

Stable at normal temperatures and pressures

10.3 Possibility of hazardous reactions

No hazardous reactions known if used for its intended purposes

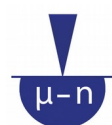
10.4 Conditions to avoid

Avoid excessive heat and incompatible substances

10.5 Incompatible materials

Strong oxidising agents, strong acids, strong bases, ammonia

10.6 Hazardous decomposition products



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Carbon oxides (CO, CO₂), ammonia, nitric acids, nitrogen oxides (NO_x) and silver metal fumes

Section 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure:

- Eye contact:** May cause redness, severe eye irritation, pain or corrosive eye damage
Skin contact: May cause serious skin irritation, redness, allergic contact dermatitis and chemical burns
Inhalation: May cause cough and severe irritation of the respiratory tract
Ingestion: May cause severe irritations or burns to mouth, throat and stomach
Chronic: Prolonged and repeated exposure may lead to skin sensitisation and to reproductive toxicity
Prolonged and repeated ingestion or inhalation of silver may yield to an irreversible blue-grey discoloration of the skin

Toxicological data:

Ingredient	Toxicity	Irritation
Silver, metal	Dermal (rabbit) LD50: 2000mg/kg	Not established
	Inhalation (rat) LC50: 5.16mg/L (4h)	Not established
	Oral (Guinea pig) LD50: >5g/kg	Not established
4-nonyl phenol, branched	Dermal (rabbit) LD50: >3160mg/kg	Not established
	Inhalation (rat) LC50: Not established	Not established
	Oral (rat) LD50: 1300mg/kg	Not established
1-piperazineethanamine	Dermal (rabbit) LD50: 866mg/kg	Not established
	Inhalation (rat) LC50: Not established	Not established
	Oral (rat) LD50: 2140µL/kg	Not established
Diethylene triamine, reaction product with diglycidyl ether of Bisphenol A	Dermal (rabbit) LD50: Not established	Not established
	Inhalation (rat) LC50: Not established	Not established
	Oral (rat) LD50: Not established	Not established
Diethylene triamine	Dermal (rabbit) LD50: 1090mg/kg	Not established
	Inhalation (rat) LC50: Not established	Not established
	Oral (rat) LD50: 1800 mg/kg	Not established
4,4'-isopropylidenediphenol	Dermal (rabbit) LD50: 3mL/kg	Not established
	Inhalation (rat) LC50: >170mg/M3	Not established
	Oral (rat) LD50: 2400 mg/kg	Not established



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Section 12: Ecological information

12.1. Toxicity

Very toxic to aquatic life

12.2 Persistence and degradability

The content is not readily biodegradable

12.3 Bioaccumulative potential

No information available

12.4 Mobility in soil

No information available

12.5 Results of PBT and vPvB assessment

No information available

12.6 Hazardous decomposition products

No experimental data available

Section 13: Disposal considerations

13.1. Waste treatment methods

Product: This material and its container must be disposed of in a safe way. Do not discharge into drains or the environment, dispose to an authorised waste collection point.

National regulations: Disposal should be in accordance with local, state or national legislation.



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Section 14: Transport information

Labels required:



14.1. UN number

UN-number: 3263

14.2 UN proper shipping name

Proper shipping name: Coorosive solid, basic, organic, N.O.S.

14.3 Transport hazard class(es)

Class: 8
ADR/RID-Classification code: E2

14.4 Packing group

Packing: II
Limited Quantity: 5kg
Excepted Quantity: 30g

14.5 Incompatible materials

ADR/RID- Environmentally hazardous: Not applicable
IMDG-Marine pollutant: Yes
IATA/ICAO-Environmentally hazardous:Not applicable

14.6 Special precautions for user

Not applicable



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14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC code

Not applicable

Section 15: Regulatory information

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

UN-number: 3077

15.2 Chemical safety assessment

All substances are listed

Section 16: Other information

RoHS Directive Compliant

This product is fully compliant with the directive 2100/65/EU Annex II (RoHS). It does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's or PBDE's.

WEEE

This product is not a piece of electrical or electronic equipment, and it therefore not governed by Directive 2002/96/EC on waste electrical and electronic equipment (WEEE)

Abbreviations:

Asp. Tox	Aspiration hazard
Carc.	Carcinogenicity
Exp.	Exposure
Flam.	Flammable
GHS	Global Harmonised System of Classification of Labelling Chemicals
Irrit.	Irritant
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
N/A	Not applicable
N/E	Not estimated
PBT	Persistent Bioaccumulative and Toxic
WEL	Workplace Exposure Limit
Repr.	Reproductive toxicant
RoHS	Restriction of Hazardous Substance
SEM	Scanning Electron Microscope
STEL	Short-Term Exposure Limit
STOT	Specific Target Organ Toxicity



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TCLo	Lowest published toxic concentration
vPvB	very Persistent and very Bioaccumulative
WEEE	Waste Electrical and Electronic Equipment

DSD / DPD label elements



Full Text Risk and Hazard codes

H314: Causes severe skin burns and eye damage
H317: May cause an allergic skin reaction
H361: Suspected of damaging fertility or the unborn child
H410: Very toxic to aquatic life with long lasting effects

R41: Risk of serious damage to eyes
R61: May cause harm to the unborn child
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Safety advice:

S02 – Keep out of reach of children.
S09 – Keep container in a well ventilated place.
S13 – Keep away from food, drink and animal feeding stuff.
S23 – Do not breath gas/fumes/vapour/spray.
S26 – In case of contact with eyes, rinse with plenty of water and seek medical help.
S281 – After contact with skin, wash immediately with detergent and plenty of waterways.
S29 – Do not empty in drains.
S35 – This materials and its container must be disposed of in a safe way.
S36 – Wear suitable protective clothing.
S37 – Wear suitable gloves.
S38 – In case of insufficient ventilation, wear suitable respiratory equipment.
S39 - Wear eye / face protection.
S40 – In case of insufficient ventilation, wear suitable respiratory equipment.
S43 – In case of fire use....
S45 – In case of accident or if you feel unwell, immediately contact Doctor or Poisons information center (show label if possible).
S46 – If swallowed, seek immediate medical advice and show label if possible.
S52 – Not recommended for interior use on large surfaces.
S53 – Avoid exposure – obtain special instructions before use.
S56 – Dispose of this materials and its container at hazardous or special waste collection point.
S57 – Use appropriate container to avoid environment contamination.
S61 – Avoid release to the environment
S63 – In case of accident by inhalation, remove casualty to fresh air and keep at rest.
S64 – If swallowed, rinse mouth with water (only if person is conscious)



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This product should be stored, handled and used in accordance with good industrial hygiene practices and in accordance with any legal regulation.

The information contained herewith is based on the present state of our knowledge and is intended to describe the product from the point of view of safety requirements. It does not guarantee any specific properties.

It is the responsibility of the user to query and verify any information seeming suspect or where doubt on the validity may exist. The buyer assumes all responsibility of using and handling the product in accordance with local, state, federal and international regulations.



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