

Product name: EM-Tec AG33 Silver filled epoxy, part B
Document Nr.: SDS00115002433B-01

Date: March 30th 2022
Version: 2.0

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

1.1. Product Identifier

EM-Tec AG33 long pot life, 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

Vof Micro to Nano
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
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
Health: R38: Irritating to skin



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Physical Environment: R41: Risk of serious damage to eyes
Not classified

Other hazards: R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
Not classified

2.2 Labeling elements

Labelling accordance to Regulation EC Nr. 1272/2008

Hazard pictogramm(s):



Signal word: Danger

Hazard statement(s): H318: Causes serious eye damage
H315: Causes skin irritation
H317: May cause an allergic skin reaction
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
P261: Avoid breathing fumes/vapours/mist
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:

P308+P313: If exposed or concerned: Get medical attention
P302+P352: If on skin: Wash with plenty of water and soap.
P333+P313: If skin irritation or a rash occurs: Get medical attention
P362+P364: Take of contaminated clothing and wash before reuse

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



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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	60-90
9,12-octadecadienoid acid based polyamidoamine	68541-13-9	7-13
Fatty acid-polyethylamine polymer	68082-29-1	5-10
3,3'-[Oxybis(2,1-ethane-diyloxy)]bis-1-propanamine	4246-51-9	1-5
triethylenetetramine	112-24-3	0.5-1.5

(* 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.
Seek medical attention if irritation persists.

Contact with skin: Wash with water and soap.
Seek medical attention if irritation persists.

Inhalation: Fresh air, keep warm and at rest.
Seek medical attention if ill effects occur

Ingestion: 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



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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

Skin contact: Irritating to skin
Symptoms: redness, severe irritation, rash (allergic contact dermatitis)

Inhalation: May cause irritation of the respiratory tract
Not available

Ingestion: May cause digestive tract irritation
Symptoms: sore throat, abdominal pain, nausea, vomiting

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

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

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 48 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



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Ensure adequate ventilation
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
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)

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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
triethylenetetramine	0.5mg/m ³	Not available	Not available	Not available
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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

Appearance/physical state: Solid, paste
Colour: Silver grey
Odour: Amine-like
pH Not available
Boiling point/range: >221°C
Flash point: >93°C (closed cup)
Evaporation rate: Not available
Explosion limits: upper limit: Not available
lower limit: Not available
Vapour pressure: <0.48 KpA
Specific gravity: 2.89 g/cm³ @ 25°C
Solubility in water: Insoluble
Auto-ignition: Not available
Viscosity @40°C : >>20.5 mm²/s



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9.2 Other information

VOC: Not available

Section 10: Stability and reactivity

10.1. Reactivity

Reacts exothermically with ketones and epoxides. May react violently with peroxides. 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, peroxides

10.6 Hazardous decomposition products

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
Triethylenetetramine can be absorbed through the skin leading to toxic effects
Hot triethylenetetramine vapours may also result in itching of the face skin with redness and swelling



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Inhalation: May cause cough, irritation of the respiratory tract
Ingestion: May cause irritation
Chronic: Prolonged and repeated exposure may lead to skin sensitisation
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) LD: 2000mg/kg	Not established
	Inhalation (rat) LC50: 5.16mg/L (4h)	Not established
	Oral (Guinea pig) LD50: >5g/kg	Not established
9,12-octadecadienoid acid based polyamidoamine	Dermal (rabbit) LD: Not established	Not established
	Inhalation (rat) LC50: Not established	Not established
	Oral (rat) LD50: >2g/kg	Not established
Fatty acid-polyethylamine polymer	Dermal (rabbit) LD: Not established	Not established
	Inhalation (rat) LC50: Not established	Not established
	Oral (rat) LD50: >2g/kg	Not established
3,3'-[Oxybis(2,1-ethane-diyloxy)]bis-1-propanamine	Dermal (rabbit) LD: 2150mg/kg	Not established
	Inhalation (rat) LC50: Not established	Not established
	Oral (rat) LD50: 4310 mg/kg	Not established
triethylenetetramine	Dermal (rabbit) LD: 805mg/kg	Not established
	Inhalation (rat) LC50: Not established	Not established
	Oral (rat) LD50: 2500 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



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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.

Section 14: Transport information

Labels required:



14.1. UN number

UN-number: 3077

14.2 UN proper shipping name

Proper shipping name: Environmentally hazardous substance, solid, N.O.S.



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14.3 Transport hazard class(es)

Class: 9
ADR/RID-Classification code: E1

14.4 Packing group

Packing: III
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

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



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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
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

H318: Causes serious eye damage
H315: Causes skin irritation
H317: May cause an allergic skin reaction
H410: Very toxic to aquatic life with long lasting effects

R38: Irritating to skin
R41: Risk of serious damage to eyes
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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)

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.

