

Product name: EM-Tec AG46 water-based conductive silver paint
Document Nr.: SDS0015002146-01

Date: October 17th 2017
Version: 1.0

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

1.1. Product Identifier

EM-Tec AG46 water-based conductive silver paint

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

Against electrostatic charge, bonding SEM samples and making grounding paths for SEM samples

1.3. Details of the supplier of the Safety Data Sheet

Vof Micro to Nano
Wateringweg 79
2031EK 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:	None
Health:	Reproductive Toxicity Category 1A
Environment:	Chronic aquatic hazard category 1
Other hazards:	None

Classification according to Regulation EC Nr. 1272/2008

	Xn: Harmful
Health:	R60: May impair fertility R61: May cause harm to the unborn child
Physical	Not classified
Environment:	R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
Other hazards:	Not classified



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2.2 Labeling elements

Labelling accordance to Regulation EC Nr. 1272/2008



Hazard pictogramm(s):

Signal word:

Danger

Hazard statement(s):

H360: May damage 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: Obtain special instructions before use
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 advice / attention
P391: Collect spillage

Storage:

P405: Store locked up

Disposal:

P501: Dispose of contents/container in accordance with local regulations

Supplemental hazard info:

None

2.3 Other hazards

Inhalation may produce health damage

Cumulative effects may result following exposures

N-Methyl-2-pyrrolidone is listed as ECHA candidate for the list of Substances of Very High Concern (SVHC)

Section 3: Composition / information on components

3.1. Substances

Not applicable



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3.2 Mixtures

1. CAS Nr 2. EC Nr 3. Index Nr 4. REACH No	% (weight)	Name	Classification according to directive 67/548/EEC [DSD]	Classification according to regulation Nr 1272/2008 [CLP]
7440-22-4 231-131-3 not available 01-2119555669-21-xxxx	48	silver	R52	Not applicable
14807-96-6 238-877-9 Not available Not available	2	talc	R20/22/61	Acute Tox. Cat. 4, Spec. target organ Tox. Cat.3; H332, H335
126-33-0 204-783-1 016-031-00-8 01-2119565139-32-xxxx	1	sulfolane	R20/22	Acute Tox. Cat. 4; H302
872-50-4 212-828-1 606-021-00-7 01-2119472430-46-xxxx	0.3	N-methyl-2-pyrrolidone	R36/60/61	Reproductive Tox. Cat. 1B, Eye Irr. Cat. 2, Spec. target organ Tox. Cat.3, Skin Irr. Cat. 2; H360D, H319, H335, H315

(* 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



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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

Inhalation:	Not normally a hazard due to the non-volatile nature of product
Ingestion:	Not classified
Skin contact:	Not known to produce adverse health effects or skin irritation
Eye contact:	Not known to be an eye irritant, direct contact with the eye should be avoided and may cause transient discomfort characterized by tearing or redness

4.3. Indication of any immediate medical attention and special treatment

General advice: 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 sand, graphite powder, dry sodium based extinguishers
Do not use water, CO₂, foam or halogenated fire extinguishing agents

5.2 Special hazards arising from the substance or mixture

Reacts with acids producing flammable / explosive hydrogen gas
Avoid exposure to oxidising agents

5.3 Advice to firefighters

Fight fire from a safe distance, with adequate cover
Metal dust fires may burn violently or may be explosively reactive
In case of fire; do not breathe fumes
Wear self-contained breathing apparatus for fire fighting



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Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Do not allow metal dust of fine particles to accumulate
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

Absorb spillage in suitable inert material
Clean up spills immediately
Control personal contact with the substance, by using protective equipment
Collect spillage, absorbed spillage and wipes in a flammable waste container
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 accumulating of metal dust and fine particles
Ensure adequate ventilation
Avoid contact with skin and eyes
Wash thoroughly after use
Wear protective gloves/protective clothing/eye protection/face protection
Have eyewash bottles available

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed, in a cool, well ventilated place
Store away from oxidising agents
Keep cool
Keep out of reach of children



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7.3 Specific end uses(s)

Against electro-static charge
Making grounding paths.
Bonding SEM specimens

Section 8: Exposure control and personal protection

8.1. Control parameters

Exposure limits

Occupational exposure limits (OEL)

Ingredient	Material Name	Source	TWA	STEL	Peak	Notes
N-methyl-2-pyrrolidone	N-methyl-2-pyrrolidone	UK	40mg/m3	80mg/m3	Not available	Skin
Talc	Talc	UK	1mg/m3	548mg/m3	Not available	Skin
Silver flakes	Silver (metal) Ag	UK	0.1mg/m3	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:
Hands and skin: Wear suitable gloves against chemicals; recommended gloves:
Nitrile
Eyes: Wear safety goggles or safety glasses with side shields

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance/physical state: Liquid
Colour: Metallic silver
Odour: Solvent
pH not applicable
Boiling point/range: 100°C
Flash point: Not available
Evaporation rate: Not available



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Explosion limits: upper limit: Not available
lower limit: Not available
Vapour pressure: 2.3 Kpa
Relative density: 1.5 g/cm³ @ 20°C
Solubility in water: miscible
Auto-ignition: Not available
Viscosity: 195 cP

9.2 Other information

VOC: None

Section 10: Stability and reactivity

10.1. Reactivity

No hazardous reactions known if used for its intended purposes

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 incompatible substances

10.5 Incompatible materials

Strong oxidising agents, strong acids

10.6 Hazardous decomposition products

Methane, hydrogen, CO, CO₂, nitrous oxides and smoke



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Section 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure:

Inhalation: Not thought to produce adverse health effects or irritation of the respiratory tract
Skin contact: Not thought to produce adverse health effects or skin irritation following contact
Eye contact: Irritation to eyes

Toxicological data:

Ingredient	Toxicity	Irritation
Silver, metal	Oral (rat) LD50: >2000 mg/kg	Not available
Talc	Not available	Skin (human): 0.3mg/3d - mild
Sulfolane	Dermal (rat) LD: 2000mg/kg	Eye (rabbit): 253mg - mild
	Inhalation (rat) LC50: 12mg/l/4h	
	Oral (rat) LD50: 1942 mg/kg	
N-methyl-2 pyrrolidone	Dermal (rat) LD: >5000mg/kg	Eye (rabbit): 100mg - moderate
	Inhalation (rat): 8300ppm/4hr	
	Oral (rat) LD50: 3914 mg/kg	
EM-Tec AG46 water-based conductive silver paint	Not available	Not available

Section 12: Ecological information

12.1. Toxicity

Not available

12.2 Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
Silver	HIGH	HIGH
sulfolane	HIGH	HIGH
N-methyl-2pyrrolidone	LOW	LOW



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12.3 Bioaccumulative potential

Ingredient	Bioaccumulation
sulfolane	LOW (BCF = 13)
N-methyl-2pyrrolidone	LOW (BCF = 0.16)

12.4 Mobility in soil

Ingredient	Bioaccumulation
sulfolane	LOW (KOC = 21.59)
N-methyl-2pyrrolidone	LOW (KOC = 20.94)

12.5 Results of PBT and vPvB assessment

No information available

12.6 Hazardous decomposition products

No experimental data available

Section 13: Disposal considerations

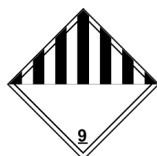
13.1. Waste treatment methods

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:



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14.1. UN number

UN-number: 3082

14.2 UN proper shipping name

Proper shipping name: Environmentally Hazardous Substance Liquid, N.O.S.

14.3 Transport hazard class(es)

Class: 9
ADR/RID-Classification code: M6

14.4 Packing group

Packing: III
Limited Quantity 5L

14.5 Incompatible materials

ADR/RID- Environmentally hazardous: Not applicable
IMDG-Marine pollutant: No relevant data
IATA/ICAO-Environmentally hazardous: No relevant data

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: 3082

15.2 Chemical safety assessment

No information available



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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
Cat.	Category
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



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Full Text Risk and Hazard codes

H226 – Flammable liquid and vapour.
H228 – Flammable solid
H302 – Harmful if swallowed.
H312 – Harmful in contact with skin.
H314 – Causes severe skin burns and eye damage
H315 – Causes skin irritation.
H317 – May cause an allergic skin reaction.
H319 – Causes serious eye irritation.
H332 – Harmful if inhaled.
H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 – May cause respiratory irritation.
H340 – May cause genetic defects.
H351 – Suspected of causing cancer.
H360 – May damage fertility or the unborn child.
H360D – Suspected of damaging the unborn child.
H370 – Causes damages to organs.
H371 – May cause damage to organs.
H372 – Causes damage to organs through prolonged or repeated exposure.
H400 – Very toxic to aquatic life.
H410 – Very toxic to aquatic life with long lasting effects.
H411 – Toxic to aquatic life with long lasting effects.
H413 – May cause long lasting harmful effects to aquatic life.

R10 – Flammable.
R20- Harmful by inhalation.
R20/22 – Harmful by inhalation and if swallowed.
R36 – Irritating to eyes.
R37 – Irritating respiratory system.
R38 – Irritating to skin.
R52 – Harmful to aquatic organisms
R63 – Possible risk of harm to the unborn child.
R65 – Harmful – May cause long damage if swallowed
R66 – Repeated exposure may cause skin dryness and cracking.

Safety advice:

S02 – Keep out of reach of children.
S09 – Keep container in a well-ventilated place.
S13 – Keep away from food, drinks, and animal feeding stuff.



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- S16 – Keep away from sources of ignition. No smoking.
- 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.
- S33 – Take precautionary measures against static discharges.
- S35 – This material 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.
- S41 – In case of fire and/or explosion; DO NOT breathe fumes.
- 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 material 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.



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