Regulation EC Nr. 1907/2006 Art.31

Product name: EM-Tec AG44 conductive silver paint **Date:** October 17th 2017

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

1.1. Product Identifier

EM-Tec AG44 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: Flammable liquid, category 2 **Health:** Aspiration irritation, category 1

Skin corrosion/irritation category 2

Eye irritation, category 2 Single exposure category 3

May cause drowsiness or dizziness

Environment: Chronic aquatic hazard category 1

Other hazards: None

Classification according to Regulation EC Nr. 1272/2008

F: HIGHLY FLAMMABLE

Xi: Irritant Xn: Harmful



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Health: R36: Irritating to eyes

R38: Irritating to skin

R48/20: Harmful: danger of serious damage to health by prolonged exposure

through inhalation

R67: Vapours may cause drowsiness and dizziness

Physical R11: Highly flammable

Environment: R50/53: Very 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): H225: Highly flammable liquid and vapour

H319: Causes serious eye irritation H336: May cause drowsiness or dizziness

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

P210: Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking P233: Keep container tightly closed

P240: Ground-bond container and receiving equipment

P241: Use explosion proof electrical/ventilating/lighting/intrinsically safe

equipment

P242: Use only non-sparking tools

P243: Take precautions against static discharge P261: Avoid breathing mist/vapours/spray

P270: Do not eat, drink or smoke when using this product P 271: Use outdoors or in well ventilated area (fume hood)

P 273: Avoid release to the environment

P280: Wear protective gloves/protective clothing/eye protection/face



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protection

Response: P301+P310: If swallowed: Immediately call a poison

Center/doctor/physician/first aider P331: No NOT induce vomiting

P312: Call a poison center/doctor/physician/first aider if you feel unwell P370+378: In case of fire: Use alcohol resistant foam or protein foam for

extinction

P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove

contact lenses if easy to do. Continue rinsing.

P337+P313: If eye irritation persists: Get medical attention

P303+P361+P353: If on skin (or hair): Take off immediately all contaminated clothing.

Rinse skin with water/shower

P304+P340: If inhaled: Remove person to fresh air and keep comfortable for

breathing

P362+P364: Take of contaminated clothing and wash before reuse

P391: Collect spillage

Storage: P403+P235: Store in a well-ventilated place. Keep cool

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

REAch + Art.57-59: The mixture does not contain Substances of Very High Concern (SVHC) at the SDS

print date

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	50	silver	R52	Not applicable
110-43-0 203-767-1 606-024-00-3 01-2119902391-49-xxxx	10	Amyl/methyl ketone	R10R20/22	Flam. Liq. 3, Acute Tox, 4; H226, H332, H302
67-64-1 200-662-2 606-001-00-8 01-2119471330-49-xxxx	11	acetone	R11R36R66R67	Flam. Liq. 2, Eye Irri. 2, STOT SE 3; H225, H319, H336, EUH066
616-38-6 210-478-4 607-013-00-6 01-2119822377-36-xxxx	16	Dimethyl carbonate	R11R66	Flam. Liq. 2; H225
108-65-6 203-603-9 607-195-00-7 01-2119475791-29-xxxx	1	Propylene glycol monomethyl ether acetate, alpha- isomer	R11R66	Flam. Liq. 3; H225

^{(*} 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 of ill effects occur

Ingestion: If swallowed, do not induce vomiting

Seek immediate medical advice



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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

Inhalation: Excessive inhalation of solvent vapours may give rise to nausea, blurred vision,

fatigue, headaches and dizziness

Ingestion: May cause respiratory and digestive tract irritation

Symptoms: sore throat, abdominal pain, nausea, vomiting

Skin contact: Mildly irritating to skin

Symptoms: redness and pain

Eye contact: Irritating to eyes

Symptoms: redness and pain, impaired vision

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

Chemical reaction with CO2 may produce flammable and explosive methane 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

Shut off all ignition sources

Do not allow metal dust of fine particles to accumulate

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

Absorb spillage in suitable inert material
Clean up spills immediately
Avoid breathing vapours
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

Keep away from sources of ignition
Take precautions against static discharges
Equipment should be grounded
Use explosion proof electrical/ventilating/lighting/equipment
Only use non-sparking tools
Do not breathe aerosols or vapours
Avoid accumulating of metal dust and fine particles
Ensure adequate ventilation



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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 Keep away from ignition sources Store away from oxidising agents Keep cool Keep out of reach of children

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
Amyl methyl ketone	Heptan-2-one	UK	237mg/m3	475mg/m3	Not available	Skin
		EU	238mg/m3	475mg/m3	Not available	Skin
acetone	Acetone	UK	1210mg/m3	3620mg/m3	Not available	Not available
		EU	1210mg/m3	Not available	Not available	Not available
Dimethyl carbonate	Dimethyl carbonate	UK	Not available	Not available	Not available	Not available
manamathul athar	1-Methoxypropyl acetate	UK	274mg/m3	548mg/m3	Not available	Skin
		EU	275mg/m3	548mg/m3	Not available	Skin
Silver flakes	Silver (metal) Ag	UK	0.1mg/m3	Not available	Not available	Not available



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8.2 Exposure controls

Control procedures: Ensure adequate ventilation

Keep away from heat sources and ignition sources

Take precautions against static discharges

Personal protection: Take precautions to avoid contact with eyes and skin when handling the products

Ensure adequate ventilation

Inhalation: In case of insufficient ventilation, wear suitable respiratory equipment:

Air purifying respirator with organic gas/vapour cartridge (type A)

Date:

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: Liquid

Colour: Metallic silver
Odour: Solvent
pH not applicable

Boiling point/range: 56°C

Flash point: -17°C (closed cup)
Evaporation rate: not available

Explosion limits: upper limit: 13% lower limit: 2%

Vapour pressure: 11 Kpa

Relative density: 1.7 g/cm3 @ 20°C **Solubility in water:** partly miscible

Auto-ignition: >315°C **Viscosity:** 873 cSt

9.2 Other information

VOC: Not available



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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 overheating, ignition sources and incompatible substances

10.5 Incompatible materials

Strong oxidising agents, strong acids

10.6 Hazardous decomposition products

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

Section 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure:

Inhalation: Inhalation of solvent vapours may give rise to nausea, headaches and dizzinessSkin 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
Amyl methyl ketone	Dermal (rabbit) LD: 12600mg/l	Skin (rabbit): 14mg/24h - mild



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	Inhalation (rat) LC50: 4000ppm/4h	
	Oral (rat) LD50: 1670 mg/kg	
Acetone	Dermal (rabbit) LD: 20000mg/l	Eye (human): 500ppm - irritant
	Inhalation (rat) LC50: 50.1mg/l/8h	Eye (rabbit): 20mg/24h - moderate
	Oral (rat) LD50: 5800 mg/kg	Skin (rabbit): 500mg/24hr - mild
Dimethyl carbonate	Dermal (rabbit) LD: >5000mg/kg	
	Oral (rat) LD50: 13000 mg/kg	
Propylene glycol monomethyl ether acetate, alpha isomer	Dermal (rabbit) LD: >5000mg/kg	Nil reported
	Inhalation (rat) LC50: 4345ppm/6h	
	Oral (rat) LD50: >8532 mg/kg	
EM-Tec AG44 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
Dimethyl carbonate	HIGH	HIGH
acetone	LOW (Half-life = 14 days)	Medium (Half-life = 116.25 days)
Amyl methyl ketone	LOW	LOW
Propylene glycol monomethyl ether acetate, alpha-isomer	LOW	LOW

12.3 Bioaccumulative potential

Ingredient	Bioaccumulation
amyl methyl ketone	LOW (LogKOW = 1.98)
acetone	LOW (BCF = 0.69
Dimethyl carbonate	LOW (LogKOW = 0.2336)



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Propylene glycol monomethyl ether acetate, alpha-isomer LOW (LogKOW = 0.56)

12.4 Mobility in soil

Ingredient	Bioaccumulation
amyl methyl ketone	LOW (KOC = 24)
acetone	HIGH (KOC = 1.981)
Dimethyl carbonate	LOW (KOC = 8.254)
Propylene glycol monomethyl ether acetate, alpha-isomer	HIGH (KOC = 1.838)

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.

Containers may still present a chemical hazard when empty

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: 1263

14.2 UN proper shipping name

Proper shipping name: PAINT

14.3 Transport hazard class(es)

Class: 3
ADR/RID-Classification code: F1

14.4 Packing group

Packing: II
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

ADR/RID-Tunnel code: (D/E)
IMDG-EMS: F-E, S-E
IATA/ICAO-PAX: 353
IATA/ICAO-CAO: 364
IATA/ICAO-DGR: Y341

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: 1263



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15.2 Chemical safety assessment

No information available

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

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.

H317 – May cause an allergic skin reaction.

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.

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.

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.



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- 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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