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 pictogram(s):

- Flammable liquid and vapour
- Eye irritation
- Aquatic toxicity

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 protection

Micro to Nano
Innovative Microscopy Supplies

Wateringweg 79 T +31-85-2013155
2031EK Haarlem E info@microtonano.com
The Netherlands I www.microtonano.com
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
### 3.2 Mixtures

<table>
<thead>
<tr>
<th>1. CAS Nr</th>
<th>2. EC Nr</th>
<th>3. Index Nr</th>
<th>4. REACH No</th>
<th>% (weight)</th>
<th>Name</th>
<th>Classification according to directive 67/548/EEC [DSD]</th>
<th>Classification according to regulation Nr 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-22-4</td>
<td>231-131-3</td>
<td>not available</td>
<td>01-2119555669-21-xxxx</td>
<td>50</td>
<td>silver</td>
<td>R52</td>
<td>Not applicable</td>
</tr>
<tr>
<td>110-43-0</td>
<td>203-767-1</td>
<td>606-024-00-3</td>
<td>01-2119902391-49-xxxx</td>
<td>10</td>
<td>Amyl/methyl ketone</td>
<td>R10R20/22</td>
<td>Flam. Liq. 3, Acute Tox, 4; H226, H332, H302</td>
</tr>
<tr>
<td>616-38-6</td>
<td>210-478-4</td>
<td>607-013-00-6</td>
<td>01-2119822377-36-xxxx</td>
<td>16</td>
<td>Dimethyl carbonate</td>
<td>R11R66</td>
<td>Flam. Liq. 2; H225</td>
</tr>
<tr>
<td>108-65-6</td>
<td>203-603-9</td>
<td>607-195-00-7</td>
<td>01-2119475791-29-xxxx</td>
<td>1</td>
<td>Propylene glycol monomethyl ether acetate, alpha- isomer</td>
<td>R11R66</td>
<td>Flam. Liq. 3; H225</td>
</tr>
</tbody>
</table>

(* 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.
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
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

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material Name</th>
<th>Source</th>
<th>TWA</th>
<th>STEL</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amyl methyl ketone</td>
<td>Heptan-2-one</td>
<td>UK</td>
<td>237mg/m³</td>
<td>475mg/m³</td>
<td>Not available</td>
<td>Skin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EU</td>
<td>238mg/m³</td>
<td>475mg/m³</td>
<td>Not available</td>
<td>Skin</td>
</tr>
<tr>
<td>acetone</td>
<td>Acetone</td>
<td>UK</td>
<td>1210mg/m³</td>
<td>3620mg/m³</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EU</td>
<td>1210mg/m³</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Dimethyl carbonate</td>
<td>Dimethyl carbonate</td>
<td>UK</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Propylene glycol monomethyl ether acetate</td>
<td>1-Methoxypropyl acetate</td>
<td>UK</td>
<td>274mg/m³</td>
<td>548mg/m³</td>
<td>Not available</td>
<td>Skin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EU</td>
<td>275mg/m³</td>
<td>548mg/m³</td>
<td>Not available</td>
<td>Skin</td>
</tr>
<tr>
<td>Silver flakes</td>
<td>Silver (metal) Ag</td>
<td>UK</td>
<td>0.1mg/m³</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>
## 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)

**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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance/physical state:</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Colour:</strong></td>
<td>Metallic silver</td>
</tr>
<tr>
<td><strong>Odour:</strong></td>
<td>Solvent</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>not applicable</td>
</tr>
<tr>
<td><strong>Boiling point/range:</strong></td>
<td>56°C</td>
</tr>
<tr>
<td><strong>Flash point:</strong></td>
<td>-17°C (closed cup)</td>
</tr>
<tr>
<td><strong>Evaporation rate:</strong></td>
<td>not available</td>
</tr>
<tr>
<td><strong>Explosion limits:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>upper limit:</strong></td>
<td>13%</td>
</tr>
<tr>
<td><strong>lower limit:</strong></td>
<td>2%</td>
</tr>
<tr>
<td><strong>Vapour pressure:</strong></td>
<td>11 Kpa</td>
</tr>
<tr>
<td><strong>Relative density:</strong></td>
<td>1.7 g/cm³ @ 20°C</td>
</tr>
<tr>
<td><strong>Solubility in water:</strong></td>
<td>partly miscible</td>
</tr>
<tr>
<td><strong>Auto-ignition:</strong></td>
<td>&gt;315°C</td>
</tr>
<tr>
<td><strong>Viscosity:</strong></td>
<td>873 cSt</td>
</tr>
</tbody>
</table>

### 9.2 Other information

**VOC:** Not available
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 dizziness
Skin contact: Not thought to produce adverse health effects or skin irritation following contact
Eye contact: Irritation to eyes

Toxicological data:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Toxicity</th>
<th>Irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver, metal</td>
<td>Oral (rat) LD50: &gt;2000 mg/kg</td>
<td>Not available</td>
</tr>
<tr>
<td>Amyl methyl ketone</td>
<td>Dermal (rabbit) LD: 12600mg/l</td>
<td>Skin (rabbit): 14mg/24h - mild</td>
</tr>
</tbody>
</table>
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**Version:** 1.0

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl carbonate</td>
<td>HIGH</td>
<td>HIGH</td>
</tr>
<tr>
<td>acetone</td>
<td>LOW (Half-life = 14 days)</td>
<td>Medium (Half-life = 116.25 days)</td>
</tr>
<tr>
<td>Amyl methyl ketone</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>Propylene glycol monomethyl ether acetate, alpha isomer</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

**Section 12: Ecological information**

**12.1. Toxicity**

Not available

**12.2 Persistence and degradability**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>amyl methyl ketone</td>
<td>LOW (LogKOW = 1.98)</td>
</tr>
<tr>
<td>acetone</td>
<td>LOW (BCF = 0.69)</td>
</tr>
<tr>
<td>Dimethyl carbonate</td>
<td>LOW (LogKOW = 0.2336)</td>
</tr>
</tbody>
</table>
Propylene glycol monomethyl ether acetate, alpha-isomer | LOW (LogKOW = 0.56)

12.4 Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>amyl methyl ketone</td>
<td>LOW (KOC = 24)</td>
</tr>
<tr>
<td>acetone</td>
<td>HIGH (KOC = 1.981)</td>
</tr>
<tr>
<td>Dimethyl carbonate</td>
<td>LOW (KOC = 8.254)</td>
</tr>
<tr>
<td>Propylene glycol monomethyl ether acetate, alpha-isomer</td>
<td>HIGH (KOC = 1.838)</td>
</tr>
</tbody>
</table>

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:
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
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%
- LCl0: 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**

- **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 an allergic skin reaction.
- **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.

**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.