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

1.1. Product Identifier

EM-Tec AC29 conductive silver coated copper 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: Acute Toxicity (oral), category 4
Eye irritation, category 2
Single exposure category 3
May cause drowsiness or dizziness
Environment: Chronic aquatic hazard category 2
Other hazards: None

Classification according to Regulation EC Nr. 1272/2008

F: HIGHLY FLAMMABLE
Xi: Irritant
Xn: Harmful
Health: R36: Irritating to eyes
Safety Data Sheet

Product name: EM-Tec AC29 conductive silver coated copper paint
Document Nr.: SDS0015002129-01
Date: July 24th 2018
Version: 1.0

Document address:
Wateringweg 79
2031EK Haarlem
The Netherlands

Phone: +31-85-2013155
E-mail: info@microtonano.com
Website: www.microtonano.com

R22 Harmful if swallowed
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):

Signal word: Danger

Hazard statement(s):
H225: Highly flammable liquid and vapour
H302: Harmful if swallowed
H319: Causes serious eye irritation
H336: May cause drowsiness or dizziness
H411: 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 masks

Micro to Nano
Innovative Microscopy Supplies
Response: P301+P312: If swallowed: 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
P330: Rinse mouth
P362+P364: Take of contaminated clothing and wash before reuse
P391: Collect spillage
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
P330: Rinse mouth
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

May produce discomfort of the respiratory system and skin
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>CAS Nr</th>
<th>EC Nr</th>
<th>Index Nr</th>
<th>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>
</table>

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

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Excessive inhalation of solvent vapours may give rise to nausea, blurred vision, fatigue, headaches and dizziness</td>
</tr>
<tr>
<td>Ingestion</td>
<td>May cause respiratory and digestive tract irritation</td>
</tr>
<tr>
<td></td>
<td>Symptoms: sore throat, abdominal pain, nausea, vomiting</td>
</tr>
<tr>
<td>Skin contact</td>
<td>May cause skin irritation</td>
</tr>
<tr>
<td></td>
<td>Symptoms: dry skin or cracking</td>
</tr>
<tr>
<td>Eye contact</td>
<td>Irritating to eyes</td>
</tr>
<tr>
<td></td>
<td>Symptoms: redness and pain, impaired vision</td>
</tr>
</tbody>
</table>

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
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
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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)

<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>copper</td>
<td>Copper dusts</td>
<td>UK</td>
<td>0.2mg/m³</td>
<td>2mg/m³</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Silver</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:
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>Appearance/physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>Light metallic brown</td>
</tr>
<tr>
<td>Odour</td>
<td>Solvent</td>
</tr>
<tr>
<td>pH</td>
<td>not applicable</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>56°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>-17°C (closed cup)</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not available</td>
</tr>
<tr>
<td>Explosion limits: upper limit</td>
<td>13%</td>
</tr>
<tr>
<td>Explosion limits: lower limit</td>
<td>2%</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>16 Kpa</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.1 g/cm³ @ 20°C</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Immiscible</td>
</tr>
<tr>
<td>Auto-ignition</td>
<td>&gt;315°C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>&lt;30 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>Copper</td>
<td>Dermal (rat) LD50: &gt;2000mg/kg</td>
<td>Nil reported</td>
</tr>
<tr>
<td></td>
<td>Inhalation (rat) LC50: 4000ppm/4hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oral (rat) LD50: 1670 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Amyl methyl ketone</td>
<td>Dermal (rabbit) LD: 12600mg/l</td>
<td>Skin (rabbit): 14mg/24h - mild</td>
</tr>
<tr>
<td></td>
<td>Inhalation (rat) LC50: 4000ppm/4hr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oral (rat) LD50: 1670 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Acetone</td>
<td>Dermal (rabbit) LD: 20000mg/l</td>
<td>Eye (human): 500ppm - irritant</td>
</tr>
<tr>
<td></td>
<td>Inhalation (rat) LC50: 50.1mg/l/8h</td>
<td>Eye (rabbit): 20mg/24h - moderate</td>
</tr>
<tr>
<td></td>
<td>Oral (rat) LD50: 5800 mg/kg</td>
<td>Skin (rabbit): 500mg/24hr - mild</td>
</tr>
<tr>
<td>Dimethyl carbonate</td>
<td>Dermal (rabbit) LD: &gt;5000mg/kg</td>
<td>Nir reported</td>
</tr>
<tr>
<td></td>
<td>Oral (rat) LD50: 13000 mg/kg</td>
<td></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>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>

12.3 Bioaccumulative potential

<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>
<tr>
<td>Propylene glycol monomethyl ether acetate, alpha-isomer</td>
<td>LOW (LogKOW = 0.56)</td>
</tr>
</tbody>
</table>

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>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Substance</th>
<th>PBT Rating</th>
</tr>
</thead>
<tbody>
<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%  
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

Full Text Risk and Hazard codes

H225: Highly flammable liquid and vapour  
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.  
H319: Causes serious eye irritation  
H332 – Harmful if inhaled.
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H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled  
H335 – May cause respiratory irritation.  
H336: May cause drowsiness or dizziness.  
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.  
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.
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.