

**Product name:** EM-Tec AC29 conductive silver coated copper paint  
**Document Nr.:** SDS0015002129-01

**Date:** February 1st 2022  
**Version:** 2.0

## 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

Rave Scientific  
100 Franklin Square Dr.  
Suite 101  
Somerset, NJ 08873  
Telephone: 1-732-898-3828  
Email: [info@ravescientific.com](mailto:info@ravescientific.com)  
Web: [www.ravescientific.com](http://www.ravescientific.com)

### 1.4 Emergency telephone number

911 (USA) 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

<b>Physical:</b>	Flammable liquid, category 2
<b>Health:</b>	Acute Toxicity (oral), category 4 Eye irritation, category 2 Single exposure category 3 May cause drowsiness or dizziness
<b>Environment:</b>	Chronic aquatic hazard category 2
<b>Other hazards:</b>	None

### Classification according to Regulation EC Nr. 1272/2008

F: HIGHLY FLAMMABLE  
Xi: Irritant  
Xn: Harmful  
**Health:** R36: Irritating to eyes

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<b>Physical</b>	R22 Harmful if swallowed
<b>Environment:</b>	R48/20: Harmful: danger of serious damage to health by prolonged exposure through inhalation R67: Vapours may cause drowsiness and dizziness R11: Highly flammable
<b>Other hazards:</b>	R50/53: Very 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):**  
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

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**Response:** protection  
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

**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

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]
67-64-1 200-662-2 606-001-00-8 01-2119471330-49-xxxx	31	acetone	R11R36R66R67	Flam. Liq. 2, Eye Irri. 2, STOT SE 3; H225, H319, H336, EUH066

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616-38-6 210-478-4 607-013-00-6 01-2119822377-36-xxxx	22	dimethyl carbonate	R11R66	Flam. Liq. 2; H225
7440-50-8 231-159-6 not available 01-2119480184-39-xxxx	20	copper	R52	Not applicable
110-43-0 203-767-1 606-024-00-3 01-2119902391-49-xxxx	13	amyl methyl ketone	R10R20/22	Flam. Liq. 3, Acute Tox, 4; H226, H332, H302
108-65-6 203-603-9 607-195-00-7 01-2119475791-29-xxxx	4	propylene glycol monomethyl ether acetate, alpha-isomer	R11R66	Flam. Liq. 3; H225
7440-22-4 231-131-3 not available 01-2119555669-21-xxxx	2	silver	R52	Not applicable

(\* 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 comfortably drink  
 Avoid giving milk or oils  
 Avoid giving alcohol

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## 4.2. Important symptoms and effects, either immediate or delayed

<b>Inhalation:</b>	Excessive inhalation of solvent vapours may give rise to nausea, blurred vision, fatigue, headaches and dizziness
<b>Ingestion:</b>	May cause respiratory and digestive tract irritation Symptoms: sore throat, abdominal pain, nausea, vomiting
<b>Skin contact:</b>	May cause skin irritation Symptoms: dry skin or cracking
<b>Eye contact:</b>	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, CO<sub>2</sub>, foam or halogenated fire extinguishing agents

### 5.2 Special hazards arising from the substance or mixture

Chemical reaction with CO<sub>2</sub> 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

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Shut off all ignition sources  
Do not allow metal dust or 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)

Ingredient	Material Name	Source	TWA	STEL	Peak	Notes
Amyl methyl ketone	Heptan-2-one	UK	237mg/m <sup>3</sup>	475mg/m <sup>3</sup>	Not available	Skin
		EU	238mg/m <sup>3</sup>	475mg/m <sup>3</sup>	Not available	Skin
acetone	Acetone	UK	1210mg/m <sup>3</sup>	3620mg/m <sup>3</sup>	Not available	Not available
		EU	1210mg/m <sup>3</sup>	Not available	Not available	Not available
Dimethyl carbonate	Dimethyl carbonate	UK	Not available	Not available	Not available	Not available
Propylene glycol monomethyl ether acetate	1-Methoxypropyl acetate	UK	274mg/m <sup>3</sup>	548mg/m <sup>3</sup>	Not available	Skin
		EU	275mg/m <sup>3</sup>	548mg/m <sup>3</sup>	Not available	Skin
copper	Copper dusts	UK	0.2mg/m <sup>3</sup>	2mg/m <sup>3</sup>	Not available	Not available
Silver	Silver (metal) Ag	UK	0.1mg/m <sup>3</sup>	Not available	Not available	Not available

### 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:



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**Hands and skin:** Air purifying respirator with organic gas/vapour cartridge (type A)  
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:** Light metallic brown  
**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:** 16 Kpa  
**Relative density:** 1.1 g/cm<sup>3</sup> @ 20°C  
**Solubility in water:** Immiscible  
**Auto-ignition:** >315°C  
**Viscosity:** <30 cSt

### 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



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## 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, CO<sub>2</sub>, 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:

Ingredient	Toxicity	Irritation
Silver, metal	Oral (rat) LD50: >2000 mg/kg	Not available
Copper	Dermal (rat) LD50: >2000mg/kg	Nil reported
	Inhalation (rat) LC50: 4000pmm/4hr	
	Oral (rat) LD50: 1670 mg/kg	
Amyl methyl ketone	Dermal (rabbit) LD: 12600mg/l	Skin (rabbit): 14mg/24h - mild
	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	Nir reported
	Oral (rat) LD50: 13000 mg/kg	

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Regulation EC Nr. 1907/2006 Art.31

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

### 12.4 Mobility in soil

Ingredient	Bioaccumulation
amyl methyl ketone	LOW (KOC = 24)

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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:



### 14.1. UN number

**UN-number:** 1263

### 14.2 UN proper shipping name

**Proper shipping name:** PAINT

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## 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

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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
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

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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.