

Product name: EM-Tec NI20 conductive nickel pen
Document Nr.: SDS0015004120-01

Date: April 4th 2022
Version: 1.0

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

1.1. Product Identifier

EM-Tec NI20 conductive nickel pen with micro tip

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

For making grounding paths on SEM samples, repairing traces on circuit boards, making contact pads.

1.3. Details of the supplier of the Safety Data Sheet

Micro to Nano VOF
Tappersweg 91
2031ET 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:	Highly flammable liquid and vapour
Health:	May cause drowsiness or dizziness Causes serious eye irritation May cause an allergic skin reaction Suspected of causing cancer Causes damage to organs through prolonged or repeated exposure
Environment:	Chronic aquatic hazard category 1
Other hazards:	None



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Classification according to Regulation EC Nr. 1272/2008

F: HIGHLY FLAMMABLE

Xi: Irritant

Xn: Harmful

Health: R36: Irritating to eyes
R38: Irritating to skin
R48: Danger of serious damage to health by prolonged exposure
R67: Vapours may cause drowsiness and dizziness

Physical R11: Highly flammable

Environment: R52: Harmful to aquatic organisms

Other hazards: Not classified

2.2 Labeling elements

Labelling accordance to Regulation EC Nr. 1272/2008

Hazard pictogram(s):



Signal word:

Hazard statement(s):

Danger

H225: Highly flammable liquid and vapour
H317: May cause an allergic skin reaction
H319: Causes serious eye irritation
H336: May cause drowsiness or dizziness
H351: Suspected of causing cancer
H372: Causes damage to organs through prolonged or repeated exposure
H412: Harmful 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
P240: Ground and bond container and receiving equipment
P241: Use explosion proof electrical/ventilating/lighting/intrinsically safe Equipment
P242: Use non-sparking tools
P243: Take action to prevent static discharges
P260: Do not breathe mist/vapours/spray



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Response:

P264: Wash all exposed external body areas thoroughly after handling
P270: Do not eat, drink, or smoke when using this product
P 271: Use only outdoors or in well ventilated area (fume hood)
P272: Contaminated work clothing should not be allowed out of the work place
P 273: Avoid release to the environment
P280: Wear protective gloves/protective clothing/eye protection/face protection
P308+P313: If exposed or concerned: Get medical attention
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.
P333+P313: If skin irritation or rash occurs: Get medical advice/attention
P337+P313: If eye irritation persists: Get medical attention
P302+P352: If on skin: Wash with plenty of water and soap.
P304+P340: If inhaled: Remove person to fresh air and keep comfortable for breathing
P303+P361+P353: If on skin (or hair): Take off immediately all contaminated clothing. Rinse with water (or shower)
P362+P364: Take off contaminated clothing and wash it before use
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 to local/regional/international regulations

Supplemental hazard info: none

2.3 Other hazards

Inhalation may produce health damage
Cumulative effects may result following exposure
May produce discomfort of the respiratory system

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]
7440-02-0 231-111-4 028-002-00-7 Not available	43	nickel	R38/R48	Not applicable
616-38-6 210-478-4 607-013-00-6 Not available	14	Dimethyl carbonate	R11	Flammable liquid 2: H225
110-43-0 203-767-1 606-024-00-3 01-2119902391-49-xxxx	9	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	12	acetone	R11R36R66R67	Flam. Liq. 2, Eye Irri. 2, STOT SE 3; H225, H319, H336, EUH066
67-63-0 200-661-7 603-117-00-0 Not available	8	isopronal	R10R36R67	Flam. Liq.2, Eye Irr. 2, Tox 3; H225, H319, H336
123-86-4 204-658-1 607-025-00-1 Not available	2	n-butyl acetate	R11R36R66R67	Flam. Liq. 3, Tox. 3; H226,, H336, EUH066
108-65-6 203-603-9 607-195-00-7 Not available	1	Propylene glycol monomethyl ether acetate alpha isomer	R10	Flam. Liq. 3; H226

(* Explanation notes: see section 16)



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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

4.2. Important symptoms and effects, either immediate or delayed

Inhalation:	Excessive inhalation of solvent vapours may give rise to cough, drowsiness, 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, irritation and dry skin
Eye contact:	Irritating to eyes Symptoms: redness, irritation 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
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Section 5: Firefighting Measures

5.1. Extinguishing media

Use dry sand, inert dry powders
Do not use water, CO₂, foam or halogenated fire extinguishing agents

5.2 Special hazards arising from the substance or mixture

The vapours are heavier than air and may accumulate in low-lying areas
Produces CO and CO₂

5.3 Advice to firefighters

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
Avoid breathing fumes/vapours
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



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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 out of reach of children
Keep away from sources of ignition
Do not breathe aerosols or vapours
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 locked up
Keep cool

7.3 Specific end uses(s)

Making grounding paths for SEM samples
Repairing traces on circuit boards
Making contact pads

Section 8: Exposure control and personal protection



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8.1. Control parameters

Exposure limits

Occupational exposure limits (OEL)

Ingredient	Material Name	Source	TWA	STEL	Peak	Notes
Nickel	Nickel	UK	0.5mg/m ³	Not available	Not available	Not available
		EU	0.5mg/m ³	Not available	Not available	Not available
Amyl methyl ketone	Heptan-2-one	UK	237mg/m ³	475mg/m ³	Not available	Skin
		EU	238mg/m ³	475mg/m ³	Not available	Skin
Acetone	Acetone	UK	1210mg/m ³	3620mg/m ³	Not available	Not available
		EU	1210mg/m ³	Not available	Not available	Not available
Isopropanol	Propanol-2-ol	UK	400mg/m ³	1250mg/m ³	Not available	Not available
		EU	400mg/m ³	1250mg/m ³	Not available	Not available
n-butyl acetate	Butyl acetate	UK	724mg/m ³	966mg/m ³	Not available	Not available
		EU	241mg/m ³	723mg/m ³	Not available	Not available
Propylene glycol monomethyl ether acetate, alpha isomer	1-Methoxypropyl-2-acetate	UK	274mg/m ³	548mg/m ³	Not available	Skin
		EU	275mg/m ³	550mg/m ³	Not available	Skin

8.2 Exposure controls

- Control procedures:** Ensure adequate ventilation
 Keep away from heat sources and ignition sources
- 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



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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, strong bases

10.6 Hazardous decomposition products

CO, CO₂ 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
Ingestion: Not classified as harmful by ingestion
Skin contact: Not thought to have harmful health effects, the material may still produce health damage following entry through wounds, lesions or abrasions
Eye contact: Irritation to eyes

Toxicological data:

Ingredient	Toxicity	Irritation
Nickel, metal	Oral (Rat) LD50: 5000mg/kg	Eye: no adverse effects
		Skin: no adverse effects
Amyl methyl ketone	Nor available	Eye: irritating
		Skin (rabbit): Primary irritant
		Skin: adverse effect observed
Acetone	Not available	Eye (human): 500ppm - irritant
		Eye (rabbit): 20mg/24h - moderate



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		Skin (rabbit): 500mg/24hr - mild
Dimethyl carbonate	Not available	Eye: no adverse effects observed
		Skin: no adverse effects observed
isopropanol	Dermal(rabbit) LD50: 3200mg/kg	Eye (rabbit): 10mg - moderate
	Inhalation (Mouse) LC50: 53mg/L4h	Skin (rabbit): 500 mg - mild
	Oral (mouse) LD50: 3600mg/kg	
n-butyl acetate	Dermal(rabbit) LD50: 3200mg/kg	Eye (rabbit): 20 - severe
	Inhalation(Mouse)LC50: 0.74mg/L4h	Skin (rabbit): 500mg/24h - moderate
	Oral (mouse) LD50: 3200mg/kg	
Propylene glycol monomethyl ether acetate, alpha-isomer	Not available	Eye: No adverse effects observed
		Skin: No adverse effects observed
EM-Tec NI20 conductive nickel pen	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
amyl methyl ketone	LOW	LOW
acetone	LOW (Half-life = 14 days)	Medium (Half-life = 116.25 days)
isopropanol	LOW (Half-life = 14 days)	LOW (half0life = 3 days)
n-butyl-acetate	LOW	LOW
Propylene glycol monomethyl ether acetate, alpha isomer	LOW	LOW



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12.3 Bioaccumulative potential

Ingredient	Bioaccumulation
Dimethyl carbonate	LOW (LogKOW = 0.2336)
amyl methyl ketone	LOW (logKOW = 1.98)
acetone	LOW (BCF = 69)
Propylene glycol monomethyl ether acetate, alpha isomer	LOW (logKOW = 0.56)

12.4 Mobility in soil

Ingredient	Bioaccumulation
Dimethyl carbonate	LOW (KOC = 8.254)
amyl methyl ketone	LOW (KOC = 24)
acetone	HIGH(KOC = 1.981)
isopropanol	High (KOC = 1.06)
n-butyl acetate	LOW (KOC = 20.86)
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



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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:



Excepted Quantity

Code E2 for all modes of transport

On air waybill, write "Dangerous goods in excepted quantity"

14.1. UN number

UN-number: 1263

14.2 UN proper shipping name

Proper shipping name: PAINT or PAINT RELATED MATERIAL

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: Yes
IATA/ICAO-Environmentally hazardous: No relevant data

14.6 Special precautions for user



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ADR/RID-Tunnelcode:	(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



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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

Full Text Risk and Hazard codes

H225: Highly flammable liquid and vapour
H317: May cause an allergic skin reaction
H319: Causes serious eye irritation
H336: May cause drowsiness or dizziness
H351: Suspected of causing cancer
H372: Causes damage to organs through prolonged or repeated exposure
H412: Harmful to aquatic life with long lasting effects

R36: Irritating to eyes
R38: Irritating to skin
R48: Danger of serious damage to health by prolonged exposure
R67: Vapours may cause drowsiness and dizziness
R11: Highly flammable
R52: Harmful to aquatic organisms

Safety advice:

S02 – Keep out of reach of children.
S09 – Keep container in a well-ventilated place.
S13 – Keep away from food, drink and animal feeding stuff.
S16 – Keep away from sources of ignition. No smoking.
S23 – Do not breathe gas/fumes/vapour/spray.
S26 – In case of contact with eyes, rinse with plenty of water and seek medical help.



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- 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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