

Electroless Copper Plating Solution

Safety Data Sheet

Section 1: Identification

1.1 Identification

Product Name : Electroless Copper Plating Solution

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

Use of the substance/mixture : Electroless Copper Plating

1.3 Details of the supplier of the safety data sheet

Nano3D Systems LLC
1110 NE Circle Blvd.,
ATAMI/Bldg. 11
Corvallis, OR 97330

1.4 Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

Section 2: Hazard(s) identification

2.1 Classification of the substance or mixture

Classification (GHS-US)

Acute toxicity, Oral (Category 4)	H302
Skin irritation (Category 2)	H315
Eye irritation (Category 2A)	H319
Acute aquatic toxicity (Category 1)	H400
Chronic aquatic toxicity (Category 2)	H410

2.2 Label elements

GHS-US labeling

Hazard pictogram (GHS-US)



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :

- H302 – Harmful if swallowed
- H315 – Causes skin irritation
- H317 – May cause an allergic reaction
- H318 – Causes serious eye damage
- H319 – Causes serious eye irritation
- H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H341 – Suspected of causing genetic defects
- H350 – May cause cancer
- H360 – May damage fertility or the unborn child
- H372 – Causes damage to organs through prolonged or repeated exposure
- H410 - Very toxic to aquatic life with long lasting effects

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Precautionary statements (GHS-US)

- : P201 – Obtain special instructions before use
- : P202 – Do not handle until all safety precautions have been read and understood
- : P260 – Do not breathe dust/fume/gas/mist/vapors/spray
- : P264 – Wash hands thoroughly after handling
- : P270 – Do not eat, drink or smoke when using this product
- : P272 – Contaminated work clothing should not be allowed out of the workplace
- : P273 – Avoid release to the environment
- : P280 – Wear protective gloves/protective clothing/ eye protection/face protection
- : P284 – [In case of inadequate ventilation] wear respiratory protection
- : P301+P312+P330 – If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth
- : P302+P352 – If on skin: Wash with plenty of water
- : P304+P340 – If inhaled: Remove person to fresh air and keep comfortable for breathing
- : P305+P351+P338+P310 – If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician
- : P308+P313 – If exposed or concerned: Get medical advice/attention
- : P310 – Immediately call a poison center/doctor
- : P332+P313 – If skin irritation occurs: Get medical advice/attention.
- : P337+P313 – If eye irritation persists: Get medical advice/attention.
- : P362 – Take off contaminated clothing and wash before reuse
- : P363 – Wash contaminated clothing and wash before reuse
- : P391 – Collect spillage.
- : P501 – Dispose of contents/ container to an approved waste disposal plant.

2.3 Other Hazards

No additional information available

2.4 Unknown acute toxicity (GHS US)

No additional information available

Section 3: Composition/information on ingredients

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3.1 Substance

Not applicable

3.2 Mixture

Name	Product Identifier	%	Classification (GHS-US)
Copper(II) Sulfate	(CAS-No.) 23254-43-5	Trade Secret	Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A; Aquatic Acute 1; Aquatic Chronic 1; H302, H315, H319, H410
Ethylenediaminetetraacetic acid	(CAS-No.) 60-00-4	Trade Secret	Eye Irrit. 2A; H319
Glyoxylic acid monohydrate	(CAS-No.) 563-96-2	Trade Secret	Eye Dam. 1; Skin Sens. 1; H317, H318
Nonylphenol ethoxylate phosphate	(CAS-No.) 68412-53-3	Trade Secret	Acute Tox. 4; Skin irrit. 2; eye irrit. 1; Aquatic Acute 2; Aquatic Chronic 2

Section 4: First Aid Measures

4.1 Description of first aid measures

General	: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
Inhalation	: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
Skin contact	: Wash off with soap and plenty of water. Consult a physician.
Eye contact	: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
Ingestion	: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician

4.2 Most important symptoms and effects, both acute and delayed

Inhalation	: May cause allergy or asthma symptoms or breathing difficulties if inhaled
Skin contact	: May cause an allergic reaction
Eye contact	: Causes serious eye damage
Ingestion	: Harmful if swallowed

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4.3 Indication of any immediate medical attention and special treatment needed

No further information available

Section 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media : None

5.2 Special hazards arising from the substance or mixture

Fire hazard : No information available

Explosion hazard : No information available

5.3 Advice for firefighters

Protection during firefighting : Wear self-contained breathing apparatus for firefighting if necessary.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel : Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.1.2 For emergency personnel : No additional information available

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

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Section 7: Handling and storage

7.1 Precautions for safe handling

Precautions for safe handling : Avoid contact with skin and eyes. Avoid formation of aerosols.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container tightly closed in a dry and well-ventilated place.

Air sensitive. hygroscopic Handle and store under inert gas.

Storage class (TRGS 510): Non Combustible Solids

Section 8: Exposure controls/personal protection

8.1 Control parameters

Copper(II) Sulfate Hydrate (CAS-No.) 23254-43-5

TWA	1.000000 mg/m ³	USA. NIOSH Recommended Exposure Limits
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Ethylenediaminetetraacetic acid (CAS-No.) 60-00-4

No exposure limit values

Glyoxylic acid (CAS-No.) 563-96-2

No exposure limit values

Nonylphenol ethoxylate phosphate (CAS-No.) 68412-53-3

PEL	1 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants
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Compound (CAS-No.)

8.2 Exposure controls

Appropriate engineering controls : Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Hand protection : Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with

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applicable laws and good laboratory practices.
Wash and dry hands.

Eye protection

: Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

: Complete suit protecting against chemicals, the type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	: Liquid
Color	: Blue
Odor	: No information available
Odor threshold	: No information available
pH	: No information available
Melting point	: No information available
Freezing point	: No information available
Boiling point	: No information available
Flash point	: No information available
Relative evaporation rate (butyl acetate = 1)	: No information available
Flammability (solid, gas)	: No information available
Explosion limits	: No information available
Explosive properties	: No information available
Vapor pressure	: No information available
Relative density	: No information available
Relative vapor density at 20 °	: No information available
Solubility	: Miscible
Log Pow	: No information available
Auto-ignition temperature	: No information available
Viscosity	: No information available
Viscosity, kinematic	: No information available
Viscosity, dynamic	: No information available

9.2 Other information

No further information available

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Section 10: Stability and reactivity

10.1 Reactivity

No information available

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No information available

10.4 Conditions to avoid

Air sensitive. hygroscopic

10.5 Incompatible materials

Strong oxidizing agents, Bases, reducing agent Powdered metals, Anhydrous copper(II) sulfate, reacts violently with: hydroxylamine, Magnesium,

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Sulphur oxides, Copper oxides
Other decomposition products - No data available

Section 11: Toxicological information

11.1 Control parameters

Acute toxicity : No information available

Copper(II) Sulfate Hydrate (CAS-No.) 23254-43-5

No information available

Ethylenediaminetetraacetic acid (CAS-No.) 60-00-4

LD50 Oral - Rat - male and female - 4,500 mg/kg

Glyoxylic acid (CAS-No.) 563-96-2

No information available

Nonylphenol ethoxylate phosphate (CAS-No.) 68412-53-3

LD50 Oral Rat > 1000 mg/kg

LD50 Dermal Rabbit > 2000 mg/kg

Compound

Skin corrosion/irritation : Causes skin corrosion

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Serious eye damage/irritation	: Risk of serious damage to eyes
Respiratory or skin sensitization	: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.
Germ cell mutagenicity	: No information available
Carcinogenicity	: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC, NTP or OSHA.
Reproductive toxicity	: Possible risk of congenital malformation in the fetus.
Specific target organ toxicity (single exposure)	: No information available
Specific target organ toxicity (repeated exposure)	: No information available
Aspiration hazard	: No information available

Additional information

Symptoms of systemic copper poisoning may include: capillary damage, headache, cold sweat, weak pulse, and kidney and liver damage, central nervous system excitation followed by depression, jaundice, convulsions, paralysis, and coma. Death may occur from shock or renal failure. Chronic copper poisoning is typified by hepatic cirrhosis, brain damage and demyelination, kidney defects, and copper deposition in the cornea as exemplified by humans with Wilson's disease. It has also been reported that copper poisoning has led to hemolytic anemia and accelerates arteriosclerosis., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12: Ecological information

12.1 Toxicity

Copper(II) Sulfate Hydrate (CAS-No.) 23254-43-5

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.024 mg/l - 48 h
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Ethylenediaminetetraacetic acid (CAS-No.) 60-00-4

Toxicity to fish	static test LC50 - Lepomis macrochirus (Bluegill sunfish) - 41 mg/l-96 h
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Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 625 mg/l - 48 h
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Glyoxylic acid (CAS-No.) 563-96-2

No information available

Nonylphenol ethoxylate phosphate (CAS-No.) 68412-53-3

Algae	EC50 Algae > 1 mg/l, 72 hours
Crustacea	EC50 Daphnia > 1 mg/l, 48 hours
Fish	LC50 Fish > 1 mg/l, 96 hours

Compound

12.2 Persistence and degradability

Copper(II) Sulfate Hydrate (CAS-No.) 23254-43-5

No information available

Ethylenediaminetetraacetic acid (CAS-No.) 60-00-4

No information available

Glyoxylic acid (CAS-No.) 563-96-2

No information available

Nonylphenol ethoxylate phosphate (CAS-No.) 68412-53-3

Expected to be inherently biodegradable

Compound

12.3 Bioaccumulative potential

Copper(II) Sulfate Hydrate (CAS-No.) 23254-43-5

No information available

Ethylenediaminetetraacetic acid (CAS-No.) 60-00-4

Bioaccumulation	Lepomis macrochirus - 28 d - 80 µg/l Bioconcentration factor (BCF): 1.8
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Glyoxylic acid (CAS-No.) 563-96-2

No information available

Nonylphenol ethoxylate phosphate (CAS-No.) 68412-53-3

No information available

Compound

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12.4 Mobility in soil

Copper(II) Sulfate Hydrate (CAS-No.) 23254-43-5

No information available

Ethylenediaminetetraacetic acid (CAS-No.) 60-00-4

Glyoxylic acid (CAS-No.) 563-96-2

No information available

Nonylphenol ethoxylate phosphate (CAS-No.) 68412-53-3

No information available

Compound

12.4 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life. May be harmful to aquatic organisms due to the shift of the pH. Avoid release to the environment.

Section 13: Disposal considerations

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

Section 14: Transportation information

14.1 Transportation information

Department of Transportation (DOT)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Copper(II) sulfate hydrate)

Reportable Quantity (RQ): 10 lbs

Marine pollutant: yes

Poison Inhalation Hazard: No

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Section 15: Regulatory information

15.1 US Federal regulations

Copper(II) Sulfate Hydrate (CAS-No.) 23254-43-5

SARA Title III, Section 313

SARA 311/312 Hazards Acute Health Hazard, Chronic Health Hazard

Ethylenediaminetetraacetic acid (CAS-No.) 60-00-4

SARA 311/312 Hazards Acute Health Hazard

Glyoxylic acid (CAS-No.) 563-96-2

SARA 311/312 Hazards Acute Health Hazard

Nonylphenol ethoxylate phosphate (CAS-No.) 68412-53-3

CERCLA Hazardous Substance List

SARA 311/312 Hazardous chemical

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)

Compound

15.2 US State regulations

Copper(II) Sulfate Hydrate (CAS-No.) 23254-43-5

Massachusetts Right To Know

Pennsylvania Right To Know

New Jersey Right To Know

Ethylenediaminetetraacetic acid (CAS-No.) 60-00-4

Massachusetts Right To Know

Pennsylvania Right To Know

New Jersey Right To Know

Glyoxylic acid (CAS-No.) 563-96-2

Massachusetts Right To Know

Pennsylvania Right To Know

New Jersey Right To Know

Nonylphenol ethoxylate phosphate (CAS-No.) 68412-53-3

Massachusetts Right To Know

Pennsylvania Right To Know

Pennsylvania Worker and Community Right-to-Know

New Jersey Right To Know

Rhode Island Right To Know

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California Proposition 65

Compound

Section 16: Other information

HMIS Rating

Health	2
Chronic Health	*
Flammability	1
Physical	0

NFPA Rating

Health	2
Fire	1
Reactivity	0

SDS Preparation date: March 1, 2017 **Supersedes previous version:** New SDS

This SDS contains revisions in the following sections(s): Not applicable. New SDS.

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End of Safety Data Sheet

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