

**MATERION****1. Chemical and company identification**

Name of chemical (Product name) **Copper Manganese Product**

Supplier's company name, address and phone number

Company name Materion Electronic Materials

Address 6070 Parkland Boulevard
Mayfield Heights, OH 44124 United States

Contact person Theodore Knudson

Telephone EH&S 1.216.383.4019

e-mail address ehs@materion.com

Emergency telephone number See Section 16.

Reference number 297

2. Hazards identification**GHS classification**

Physical hazards The product is not classified according to GHS.

Health hazards The product is not classified according to GHS.

Environmental hazards Short-term (acute) hazardous to the aquatic environment Category 1
Long-term (chronic) hazardous to the aquatic environment Category 1

GHS label elements**Pictograms****Signal words**

None.

Hazard statement

Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Precautionary statement**Prevention**

Avoid release to the environment.

Response

Collect spillage.

Storage

Store away from incompatible materials.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards which do not result in classification

None known.

Supplemental information

For further information, please contact the Product Stewardship Department at +1.216.383.4019.

Main symptoms and emergency overview**Main symptoms**

None known.

Emergency overview

Dangerous for the environment if discharged into watercourses.

3. Composition/information on ingredients

Substance or mixture Mixture

Chemical name or generic name	CAS Number	Gazette notification		Concentration (%)
		ENCS no.	ISHL no.	
Copper	7440-50-8			85 - 99.9
Manganese	7439-96-5			0.1 - 15

Chemical formula Cu (7440-50-8), Mn (7439-96-5)

4. First aid measures

If inhaled	Move to fresh air. Call a physician if symptoms develop or persist.
If on skin	Wash off with soap and water. Get medical attention if irritation develops and persists.
If in eyes	Rinse with water. Get medical attention if irritation develops and persists.
If swallowed	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	None known.
Protection of first-aid responders	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.
Notes to physician	Treat symptomatically.

5. Fire-fighting measures

Extinguishing media	Powder. Dry sand.
Extinguishing media to avoid	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards	During fire, gases hazardous to health may be formed.
Special fire fighting procedures	Move containers from fire area if you can do so without risk.
Protection of fire-fighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
General fire hazards	No unusual fire or explosion hazards noted.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Environmental precautions	Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
Methods and materials for containment and cleaning up	Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk. Following product recovery, flush area with water. For waste disposal, see section 13 of the SDS.

7. Handling and storage

Handling	
Technical measures (e.g. Local and general ventilation)	Provide adequate ventilation.
Safe handling advice	Avoid prolonged exposure. Avoid release to the environment. Observe good industrial hygiene practices. Use personal protection recommended in Section 8 of the SDS.
Contact avoidance measures	For further information, please refer to section 10 of the SDS.
Hygiene measures	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.
Storage	
Safe storage conditions	Store away from incompatible materials (see Section 10 of the SDS).
Safe packaging materials	Store in original tightly closed container.

8. Exposure controls/personal protection

Control parameters	Follow standard monitoring procedures.
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Occupational exposure limits

Japan. OELs - ISHL. Working Environment Measurement Standards, Ministry of Labor Notice No. 79 of September 1, 1988, as amended

Components	Type	Value
Manganese (CAS 7439-96-5)	TLV	0.05 mg/m ³

Japan. OELs - JSOH (Japan Society of Occupational Health) Recommendation of Occupational Exposure Limits

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	0.1 mg/m ³	Total particulate.
		0.02 mg/m ³	Respirable particles.

US. ACGIH Threshold Limit Values (TLV)

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
		0.2 mg/m ³	Fume.
Manganese (CAS 7439-96-5)	TWA	0.1 mg/m ³	Inhalable fraction.
		0.02 mg/m ³	Respirable fraction.

Engineering measures

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
Hand protection	Wear gloves to prevent metal cuts and skin abrasions during handling.
Eye protection	Wear safety glasses with side shields (or goggles).
Skin and body protection	Wear suitable protective clothing.

9. Physical and chemical properties

Physical state	Solid.
Form	Solid.
Color	Not available.
Odor	None.
Odor threshold	Not applicable.
Melting point/freezing point	1981.4 °F (1083 °C) estimated
Boiling point, initial boiling point, and boiling range	3741.8 °F (2061 °C) estimated
Combustibility	Not flammable
Lower and upper explosion limit / flammability limit	
Explosive limit - lower (%)	Not applicable.
Explosive limit - lower (%) temperature	Not applicable.
Explosive limit - upper (%)	Not applicable.
Explosive limit - upper (%) temperature	Not applicable.
Flash point	Not applicable.
Auto-ignition temperature	842 °F (450 °C) estimated
Decomposition temperature	Not applicable.
pH	Not applicable.
Kinematic viscosity	Not applicable.
Solubility(ies)	
Solubility (water)	Insoluble

Partition coefficient (n-octanol/water) (log value)	Not applicable.
Vapor pressure	0.58 hPa estimated
Density and/or relative density	
Density	8.72 g/cm ³ estimated
Relative density	Not applicable.
Vapor density	Not applicable.
Particle characteristics	Not available.
Other information	
Evaporation rate	Not applicable.
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Specific gravity	8.73 estimated
Viscosity temperature	Not applicable.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Acute toxicity	100% of the mixture consists of component(s) of unknown acute dermal toxicity. 99% of the mixture consists of component(s) of unknown acute oral toxicity.
Skin corrosion/irritation	Not likely, due to the form of the product.
Serious eye damage/eye irritation	Not likely, due to the form of the product.
Respiratory or skin sensitization	
Japan Society for Occupational Health: Skin sensitizer	
Copper (CAS 7440-50-8)	2 Probable skin sensitizer.
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	
ACGIH Carcinogens	
Manganese (CAS 7439-96-5)	A4 Not classifiable as a human carcinogen.
Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not an aspiration hazard.

12. Ecological information

Ecotoxicological data

Product		Species	Test Results
Copper Manganese Product			
Aquatic			
Crustacea	EC50	Daphnia	0.1888 mg/l, 48 hours
Fish	LC50	Fish	2.7783 mg/l, 96 hours
<i>Acute</i>			
Fish	LC50	Fish	0.0318 mg/l, 96 hours estimated
Components		Species	Test Results

Copper (CAS 7440-50-8)

Aquatic

Acute

Crustacea	EC50	Blue crab (<i>Callinectes sapidus</i>)	0.0031 mg/l
Fish	LC50	Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	0.02 mg/l, 96 hours

Ecotoxicity	Very toxic to aquatic life with long lasting effects.
Persistence and degradability	No data is available on the degradability of any ingredients in the mixture.
Bioaccumulation	No data available.
Mobility in soil	No data available for this product.
Hazardous to the ozone layer	No data available.
Other hazardous effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Residual waste	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
Local disposal regulations	Contract with a disposal operator licensed by the Law on Disposal and Cleaning. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations. When your own wastewater treatment plant is not available, collect entire waste and then charge to a licensed industrial waste management professional with manifests for industrial waste.

14. Transport information

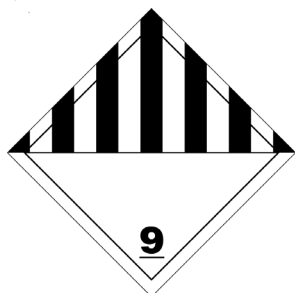
IATA

UN number	3077
UN proper shipping name	Environmentally hazardous substance, solid, n.o.s.
Transport hazard class(es)	
Class	9
Subsidiary risk	-
Packing group	III
Environmental hazards	Yes
ERG Code	9L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

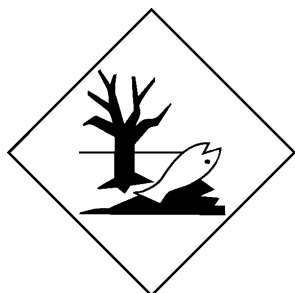
IMDG

UN number 3077
UN proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., MARINE POLLUTANT
Transport hazard class(es)
Class 9
Subsidiary risk -
Packing group III
Environmental hazards
Marine pollutant Yes
EmS F-A, S-F
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.
General information IMDG Regulated Marine Pollutant.

IATA; IMDG



Marine pollutant



National regulations Follow regulation in section 15 for domestic transportation.
Emergency Response Guide Number 171

15. Regulatory information

Industrial Safety and Health Act

Specified substances regulation

Class 2 designated chemical substances

Manganese and its compounds

Notifiable substances

Copper and Copper compounds Table 9 Ordinance No. 379 85 - 100 %
Manganese (powder) Table 9 Ordinance No. 550 0.10 - 15 %

Labeling substances

Copper and Copper compounds 85 - 100 %
Manganese (powder) 0.10 - 15 %

SDS and Risk Assessment

Manganese (powder)
Copper and Copper compounds

Poisonous and Deleterious Substances Control Act

Specified poisonous substances

Not regulated.

Poisonous substances

Not regulated.

Deleterious substances

Not regulated.

Act on the Regulation of Manufacture and Evaluation of Chemical Substances**Class I specified chemical substances**

Not regulated.

Class II specified chemical substances

Not regulated.

Monitoring chemical substances

Not regulated.

Priority Assessment Chemical Substances (PACs)

Not regulated.

Reporting Exempted Substances

Not regulated.

Law concerning Pollutant Release and Transfer Register until March 31, 2023**Specified class 1 substances (substance name, ordinance number and content)**

Not regulated.

Class 1 substances (substance name, ordinance number and content)

Manganese and its compounds (As Mn) Ordinance No. 412 15 % (Manganese)

Class 2 substances (substance name, ordinance number and content)

Not regulated.

Law concerning Pollutant Release and Transfer Register from April 1, 2023**Specified class 1 substances (substance name, control number and content)**

Not regulated.

Class 1 substances (substance name, control number and content)

Manganese and its compounds Control No. 412 15 % (Manganese)

Class 2 substances (substance name, control number and content)

Not regulated.

Ship Safety Law, Dangerous Goods Marine Transport and Storage Rule

Miscellaneous dangerous substances

Air Law, Enforcement Rule

Miscellaneous dangerous goods

Explosives Control Act

Not regulated.

Water Pollution Control Act

COPPER

Sewage Act

Copper and its compounds (as Cu) 3 MG/L

Manganese and its soluble compounds (as Mn) 10 MG/L

16. Other information**Bibliography**

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2019
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits
JIS Z 7252:2019 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"
JIS Z 7253:2019 Hazard communication of chemicals based on GHS - Labelling and Safety Data Sheet (SDS)
National Toxicology Program (NTP) Report on Carcinogens

Further information

Transportation Emergency
Call Chemtrec at:
US: 800.424.9300
International: 703.741.5970
Spain: 900.868.538
Switzerland: 0800.564.402
Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059
South Korea Toll-free Number – 080-880-0468

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Revision information

This document has undergone significant changes and should be reviewed in its entirety.