



MATERION

1. Chemical and company identification

Name of chemical (Product name)	Copper Stainless Steel Modular Target (50/50)	
Company name	Materion Advanced Materials Group	
Address	42 Mt. Ebo Road South Brewster, NY 10509 United States	
Telephone	1+845.279.0900	
Emergency telephone number	Chemtrec	1+703.527.3887
Reference number	394	

2. Hazards identification

GHS classification

Physical hazards	The product is not classified according to GHS.	
Health hazards	Serious eye damage/eye irritation	Category 2B
	Sensitization, respiratory	Category 1
	Sensitization, skin	Category 1
	Germ cell mutagenicity	Category 2
	Carcinogenicity	Category 2
	Reproductive toxicity	Category 1B
	Specific target organ toxicity, single exposure	Category 1 (digestive system, kidney, respiratory system)
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, repeated exposure	Category 1 (respiratory system)
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 1
	Hazardous to the aquatic environment, long-term hazard	Category 4

GHS label elements

Symbols



Signal words

Danger

Hazard statement

Causes eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. Suspected of causing genetic defects. Suspected of causing cancer. May damage fertility or the unborn child. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure. May cause long lasting harmful effects to aquatic life.

Precautionary statement

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection.

Response

If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. If on skin: Wash with plenty of water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Call a poison center/doctor/. If skin irritation or rash occurs: Get medical advice/attention. If experiencing respiratory symptoms: Call a POISON CENTER/doctor. Take off contaminated clothing and wash it before reuse.

Storage	Store locked up.
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	May cause respiratory irritation. May cause an allergic skin reaction. Prolonged exposure may cause chronic effects.
Emergency overview	Causes damage to organs. Suspected of causing cancer.

3. Composition/information on ingredients

Substance or mixture	Mixture			
		Gazette notification		
Components	CAS Number	ENCS no.	ISHL no.	Concentration (%)
Copper	7440-50-8			50
Iron	7439-89-6			35
Chromium	7440-47-3			9.5
Nickel	7440-02-0			4.5
Manganese	7439-96-5			0.5

Chemical formula Cu (7440-50-8), Fe (7439-89-6), Cr (7440-47-3), Ni (7440-02-0), Mn (7439-96-5)

4. First aid measures

If inhaled	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If experiencing respiratory symptoms: Call a poison center or doctor/physician.
If on skin	Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.
If in eyes	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. 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	May cause respiratory irritation. May cause an allergic skin reaction. Prolonged exposure may cause chronic effects.
Protection of first-aid responders	IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.
Notes to physician	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

5. Fire-fighting measures

Extinguishing media	Powder. Dry sand.
Extinguishing media to avoid	Carbon dioxide (CO ₂).
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 measures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. 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 or materials for containment and cleaning up Prevent product from entering drains.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. 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 Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices. Use personal protection recommended in Section 8 of the SDS.

Contact avoidance measures Strong acids. Strong oxidizing agents. For further information, please refer to section 10 of the SDS.

Hygiene measures Observe any medical surveillance requirements. 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. Contaminated work clothing should not be allowed out of the workplace.

Storage

Safe storage conditions Store locked up. Keep container tightly closed. Store in a well-ventilated place. 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

Occupational exposure limits

Japan. OELs - ISHL. (Workplace Environment Assessment Standards)

Components	Type	Value
Manganese (CAS 7439-96-5)	TLV	0.2 mg/m ³
Nickel (CAS 7440-02-0)	TLV	0.1 mg/m ³

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

Components	Type	Value
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m ³
Manganese (CAS 7439-96-5)	TWA	0.2 mg/m ³
Nickel (CAS 7440-02-0)	TWA	1 mg/m ³

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m ³	Inhalable fraction.
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.
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m ³	Inhalable 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. General ventilation normally adequate. Provide eyewash station.

Personal protective equipment

Respiratory protection

Wear positive pressure self-contained breathing apparatus (SCBA).

Hand protection

Wear appropriate chemical resistant gloves.

Eye protection

Wear safety glasses with side shields (or goggles).

Skin and body protection

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

9. Physical and chemical properties

Appearance

Physical state

Solid.

Form

Solid.

Color

Copper. Grey metallic.

Odor

None.

Odor threshold

Not applicable.

pH

Not applicable.

Melting point/Freezing point

1981.4 °F (1083 °C) estimated / Not applicable.

Boiling point, initial boiling point, and boiling range

Not applicable.

Flash point

Not applicable.

Combustion characteristics (solid, gas)

None known.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)

Not applicable.

Flammability limit - upper (%)

Not applicable.

Explosive limit - lower (%)

Not applicable.

Explosive limit - lower (%) temperature

Not applicable.

Explosive limit - upper (%)

Not applicable.

Explosive limit - upper (%) temperature

Not applicable.

Vapor pressure

Not applicable.

Vapor density

Not applicable.

Evaporation rate

Not applicable.

Specific gravity

Not applicable.

Solubility(ies)

Solubility (water)

Insoluble.

Partition coefficient (n-octanol/water)	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not applicable.
Viscosity (Coefficient of viscosity)	Not applicable.
Other information	
Density	8.66 g/cm ³ estimated
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Relative density	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 acids. Strong oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Acute toxicity	Not known.
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Causes eye irritation.

Respiratory or skin sensitization

Japan Society for Occupational Health: Respiratory sensitizer

Chromium (CAS 7440-47-3)	2 Probable respiratory sensitizer.
Nickel (CAS 7440-02-0)	2 Probable respiratory sensitizer.

Japan Society for Occupational Health: Skin sensitizer

Chromium (CAS 7440-47-3)	1 Known skin sensitizer.
Copper (CAS 7440-50-8)	2 Probable skin sensitizer.
Nickel (CAS 7440-02-0)	1 Known skin sensitizer.

Respiratory sensitization May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin sensitization May cause an allergic skin reaction.

Germ cell mutagenicity Suspected of causing genetic defects.

Carcinogenicity Suspected of causing cancer.

ACGIH Carcinogens

Manganese (CAS 7439-96-5)	A4 Not classifiable as a human carcinogen.
Nickel (CAS 7440-02-0)	A5 Not suspected as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Chromium (CAS 7440-47-3)	3 Not classifiable as to carcinogenicity to humans.
Nickel (CAS 7440-02-0)	2B Possibly carcinogenic to humans.

Japan Society for Occupational Health: Carcinogen

Nickel (CAS 7440-02-0)	1 Carcinogenic to humans.
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NTP Report on Carcinogens

Nickel (CAS 7440-02-0)	Known To Be Human Carcinogen. Reasonably Anticipated to be a Human Carcinogen.
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Reproductive toxicity May damage fertility or the unborn child.

Specific target organ toxicity - single exposure Causes damage to organs (digestive system, kidney, respiratory system). May cause respiratory irritation.

Specific target organ toxicity - repeated exposure Causes damage to organs (respiratory system) through prolonged or repeated exposure.

Aspiration hazard Not an aspiration hazard.

12. Ecological information

Ecotoxicological data

Product		Species	Test Results
Copper Stainless Steel Modular Target (50/50)			
Aquatic			
Crustacea	EC50	Daphnia	0.3199 mg/l, 48 hours estimated
Fish	LC50	Fish	5.0547 mg/l, 96 hours estimated

Components		Species	Test Results
Copper (CAS 7440-50-8)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	0.036 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	0.0319 - 0.0544 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

Dispose in accordance with all applicable regulations.

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. 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

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

General information IMDG Regulated 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 (EXCEPT
MANGANESE OXIDE, BASIC)
NICKEL COMPOUNDS (POWDER, EXCLUDING
NICKEL CARBONYL (ITEM NO. 24))

Notifiable substances

CHROMIUM AND CHROMIUM COMPOUNDS (EXCLUDING CHROMIC ACID AND CHROMIC ACID SALTS AND DICHROMIC ACID AND DICHROMATE)	Table 9 Ordinance No. 142	9.5 %
COPPER AND COPPER COMPOUNDS	Table 9 Ordinance No. 379	50 %
MANGANESE	Table 9 Ordinance No. 550	0 %
NICKEL	Table 9 Ordinance No. 418	4.5 %

Labeling substances

CHROMIUM (POWDER)	9.5 %
CHROMIUM AND CHROMIUM COMPOUNDS (EXCLUDING CHROMIC ACID AND CHROMIC ACID SALTS AND DICHROMIC ACID AND DICHROMATE)	9.5 %
COPPER (POWDER)	50 %
COPPER AND COPPER COMPOUNDS	50 %
MANGANESE (POWDER)	0 %

Poisonous and Deleterious Substances Control Act

Specified poisonous substances

Not regulated.

Poisonous substances

Not regulated.

Deleterious substances

Not regulated.

Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.

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

Specified class 1 substances (substance name, ordinance number and content)

NICKEL COMPOUNDS	Ordinance No. 309	4.5 %	(Nickel)
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Class 1 substances (substance name, ordinance number and content)

CHROMIUM AND CHROMIUM(III) COMPOUNDS	Ordinance No. 87	9.5 %	(Chromium)
MANGANESE AND ITS COMPOUNDS	Ordinance No. 412	0.50 %	(Manganese)
NICKEL	Ordinance No. 308	4.5 %	(Nickel)

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

Not regulated.

Ship Safety Law, Dangerous Goods Marine Transport and Storage Rule Not regulated.

Air Law, Enforcement Rule Not regulated.

Explosives Control Act

Not regulated.

Water Pollution Control Act

CHROMIUM

COPPER

Sewage Act

CHROMIUM AND ITS COMPOUNDS, EXCEPT HEXAVALENT CHROMIUM COMPOUNDS (AS CR)	2 MG/L
COPPER AND ITS COMPOUNDS (AS CU)	3 MG/L
IRON AND ITS SOLUBLE COMPOUNDS (AS FE)	10 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
National Toxicology Program (NTP) Report on Carcinogens
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2012
JIS Z 7252:2014 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"
JIS Z 7253:2012 Hazard communication of chemicals based on GHS - Labelling and Safety Data Sheet (SDS)

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Revision information

Composition / Information on Ingredients: Ingredients
First aid measures: Most important symptoms/effects, acute and delayed
Stability and reactivity: Conditions to avoid