



MATERION

1. Chemical and company identification

Name of chemical (Product name)	M-25 and M-65 Alloys
Company name	Materion Brush Inc.
Address	6070 Parkland Boulevard Mayfield Heights, OH 44124 United States
Telephone	+1.216.383.4019
e-mail address	ehs@materion.com
Emergency telephone number	+1.216.383.4019
Reference number	A01

2. Hazards identification

GHS classification

Physical hazards	The product is not classified according to GHS.	
Health hazards	Acute toxicity, oral	Category 4
	Acute toxicity, inhalation	Category 4
	Sensitization, respiratory	Category 1
	Sensitization, skin	Category 1
	Carcinogenicity	Category 1
	Reproductive toxicity (fertility, the unborn child)	Category 1A
	Specific target organ toxicity, repeated exposure	Category 1
Environmental hazards	The product is not classified according to GHS.	

GHS label elements

Symbols



Signal words

Danger

Hazard statement

Toxic if swallowed. May cause an allergic skin reaction. Fatal if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation. May cause cancer by inhalation. Causes damage to organs (respiratory system) through prolonged or repeated exposure.

Precautionary statement

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. 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. In case of inadequate ventilation wear respiratory protection.

Response

If on skin: Wash with plenty of water. 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

Exposure to the elements listed in Section 3 by inhalation, ingestion, and skin contact can occur when melting, casting, gross handling, pickling, chemical cleaning, heat treating, abrasive cutting, welding, grinding, sanding, polishing, milling, crushing, or otherwise heating or abrading the surface of this material in a manner which generates particulate.

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

Main symptoms and emergency overview

Main symptoms

Jaundice. Liver enlargement. Proteinuria. Irritating to mouth, throat, and stomach. Sensitization. May cause respiratory irritation. Coughing. Discomfort in the chest. Shortness of breath. Skin irritation. May cause an allergic skin reaction. Dermatitis. Rash. Edema. Prolonged exposure may cause chronic effects.

Emergency overview

DANGER

Fatal if inhaled. Very toxic. Toxic if swallowed. Harmful if absorbed through skin. Harmful in contact with eyes. Causes damage to organs. Cancer hazard. May cause an allergic skin reaction. May cause irritation to the respiratory system. May cause sensitization by skin contact. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause reproductive effects. Danger of serious damage to health by prolonged exposure. Dangerous for the environment if discharged into watercourses.

3. Composition/information on ingredients

Substance or mixture

Mixture

Components	CAS Number	Gazette notification		Concentration (%)
		ENCS no.	ISHL no.	
Copper	7440-50-8			97.1 - 98.6
Beryllium	7440-41-7			0.2 - 2.0
Nickel	7440-02-0			0.0 - 1.4
Lead	7439-92-1		(1)-527	0.2 - 0.6
Cobalt	7440-48-4			0.0 - 0.35

Synonym(s)

C17300 (M-25), C17465 (M-65), Copper Beryllium Alloy, Beryllium Copper Alloy, Copper Alloy

Chemical formula

Cu (7440-50-8), Be (7440-41-7), Ni (7440-02-0), Pb (7439-92-1), Co (7440-48-4)

4. First aid measures

If inhaled

If symptoms develop move victim to fresh air. For breathing difficulties, oxygen may be necessary. Breathing difficulty caused by inhalation of particulate requires immediate removal to fresh air. If breathing has stopped, perform artificial respiration and obtain medical help.

If on skin

Take off contaminated clothing and wash before reuse. Thoroughly wash skin cuts or wounds to remove all particulate debris from the wound. Seek medical attention for wounds that cannot be thoroughly cleansed. Treat skin cuts and wounds with standard first aid practices such as cleansing, disinfecting and covering to prevent wound infection and contamination before continuing work. Obtain medical help for persistent irritation. Material accidentally implanted or lodged under the skin must be removed.

If in eyes

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if symptoms persist.

If swallowed

If swallowed, seek medical advice immediately and show this container or label. Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

Most important symptoms/effects, acute and delayed

May cause allergic skin reaction. May cause allergic respiratory reaction. Prolonged exposure may cause chronic effects.

Protection of first-aid responders

If exposed or concerned: get medical attention/advice. Get medical attention if symptoms occur. Wash contaminated clothing before reuse. As supplied, there is no immediate medical risk with beryllium products in article form. First aid measures provided are related to particulate containing beryllium.

Notes to physician

Treatment of Chronic Beryllium Disease: There is no known treatment which will cure chronic beryllium disease. Prednisone or other corticosteroids are the most specific treatment currently available. They are directed at suppressing the immunological reaction and can be effective in diminishing signs and symptoms of chronic beryllium disease. In cases where steroid therapy has had only partial or minimal effectiveness, other immunosuppressive agents, such as cyclophosphamide, cyclosporine, or methotrexate, have been used. In view of the potential side effects of all the immunosuppressive medications, including steroids such as prednisone, they should be used only under the direct care of a physician. Other treatment, such as oxygen, inhaled steroids or bronchodilators, may be prescribed by some physicians and can be effective in selected cases. In general, treatment is reserved for cases with significant symptoms and/or significant loss of lung function. The decision about when and with what medication to treat is a judgment situation for individual physicians.

In their 2014 official statement on the Diagnosis and Management of Beryllium Sensitivity and Chronic Beryllium Disease, the American Thoracic Society states that "it seems prudent for workers with BeS to avoid all future occupational exposure to beryllium."

5. Fire-fighting measures

Extinguishing media

The product is non-combustible. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Extinguishing media to avoid

Do not use water to extinguish fires around operations involving molten metal due to the potential for steam explosions.

Special fire fighting procedures

Move containers from fire area if you can do so without risk. Water runoff can cause environmental damage.

Protection of fire-fighters

Firefighters should wear full protective clothing including self contained breathing apparatus. Wear suitable protective equipment.

Specific methods

Pressure-demand self-contained breathing apparatus must be worn by firefighters or any other persons potentially exposed to the particulate released during or after a fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency measures

In solid form this material poses no special clean-up problems. Wear appropriate protective equipment and clothing during clean-up.

Environmental precautions

Avoid release to the environment. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. 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

Clean up in accordance with all applicable regulations.

7. Handling and storage

Handling

Technical measures (e.g. Local and general ventilation)

Not available.

Safe handling advice

Not available.

Contact avoidance measures

For further information, please refer to section 10 of the SDS.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice.

Storage

Safe storage conditions

Not available.

Safe packaging materials

Keep in original container.

8. Exposure controls/personal protection

Occupational exposure limits

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

Components	Type	Value
Beryllium (CAS 7440-41-7)	TLV	0.001 mg/m3
Cobalt (CAS 7440-48-4)	TLV	0.02 mg/m3
Lead (CAS 7439-92-1)	TLV	0.05 mg/m3

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

Components	Type	Value
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
Beryllium (CAS 7440-41-7)	TWA	0.002 mg/m ³
Cobalt (CAS 7440-48-4)	TWA	0.05 mg/m ³
Lead (CAS 7439-92-1)	TWA	0.1 mg/m ³
Nickel (CAS 7440-02-0)	TWA	1 mg/m ³

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0.00005 mg/m ³	Inhalable fraction.
Cobalt (CAS 7440-48-4)	TWA	0.02 mg/m ³	
Copper (CAS 7440-50-8)	TWA	1 mg/m ³	Dust and mist.
		0.2 mg/m ³	Fume.
Lead (CAS 7439-92-1)	TWA	0.05 mg/m ³	
Nickel (CAS 7440-02-0)	TWA	1.5 mg/m ³	Inhalable fraction.

Biological limit values**Japan. BELs - JSOH (Japan Society of Occupational Health: Recommendation of Occupational Exposure Limits Based on Biological Monitoring)**

Components	Value	Determinant	Specimen	Sampling Time
Cobalt (CAS 7440-48-4)	35 µg/l	Cobalt	Urine	*
	3 µg/l	Cobalt	Blood	*
Lead (CAS 7439-92-1)	800 µg/l	Protoporphyrin	Blood	*
	2000 µg/l	Protoporphyrin	Reduction from individual baseline activity in red blood cells	*
	150 µg/l	Lead	Blood	*
	5 mg/l	δ-Aminolevulinic acid	Urine	*

* - For sampling details, please see the source document.

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Cobalt (CAS 7440-48-4)	15 µg/l	Cobalt	Urine	*
Lead (CAS 7439-92-1)	300 µg/l	Lead	Blood	*

* - For sampling details, please see the source document.

Engineering measures

VENTILATION: Good general ventilation (typically 10 air changes per hour) 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.

Whenever possible, the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate. Where utilized, exhaust inlets to the ventilation system must be positioned as close as possible to the source of airborne generation. Avoid disruption of the airflow in the area of a local exhaust inlet by equipment such as a man-cooling fan. Check ventilation equipment regularly to ensure it is functioning properly. Provide training on the use and operation of ventilation to all users. Use qualified professionals to design and install ventilation systems.

WET METHODS: Machining operations are usually performed under a liquid lubricant/coolant flood which assists in reducing airborne particulate. However, the cycling through of machine coolant containing finely divided particulate in suspension can result in the concentration building to a point where the particulate may become airborne during use. Certain processes such as sanding and grinding may require complete hooded containment and local exhaust ventilation. Prevent coolant from splashing onto floor areas, external structures or operators' clothing. Utilize a coolant filtering system to remove particulate from the coolant.

WORK PRACTICES: Develop work practices and procedures that prevent particulate from coming in contact with worker skin, hair, or personal clothing. If work practices and/or procedures are ineffective in controlling airborne exposure or visual particulate from deposition on skin, hair, or clothing, provide appropriate cleaning/washing facilities. Procedures should be written that clearly communicate the facility's requirements for protective clothing and personal hygiene. These clothing and personal hygiene requirements help keep particulate from being spread to non-production areas or from being taken home by the worker. Never use compressed air to clean work clothing or other surfaces.

Fabrication processes may leave a residue of particulate on the surface of parts, products or equipment that could result in employee exposure during subsequent material handling activities. As necessary, clean loose particulate from parts between processing steps. As a standard hygiene practice, wash hands before eating or smoking.

HOUSEKEEPING: Use vacuum and wet cleaning methods for particulate removal from surfaces. Be certain to de-energize electrical systems, as necessary, before beginning wet cleaning. Use vacuum cleaners with high efficiency particulate air (HEPA). Do not use compressed air, brooms, or conventional vacuum cleaners to remove particulate from surfaces as this activity can result in elevated exposures to airborne particulate. Follow the manufacturer's instructions when performing maintenance on HEPA filtered vacuums used to clean hazardous materials.

Ensure adequate ventilation, especially in confined areas. Good general ventilation (typically 10 air changes per hour) 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.

Whenever possible, the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate. Where utilized, exhaust inlets to the ventilation system must be positioned as close as possible to the source of airborne gene

Personal protective equipment

Respiratory protection

When airborne exposures exceed or have the potential to exceed the occupational exposure limits, approved respirators must be used as specified by an Industrial Hygienist or other qualified professional. Respirator users must be medically evaluated to determine if they are physically capable of wearing a respirator. Quantitative and/or qualitative fit testing and respirator training must be satisfactorily completed by all personnel prior to respirator use. Users of tight fitting respirators must be clean shaven on those areas of the face where the respirator seal contacts the face. Use pressure-demand airline respirators when performing jobs with high potential exposures such as changing filters in a baghouse air cleaning device.

Hand protection

Wear gloves to prevent contact with particulate or solutions. Wear gloves to prevent metal cuts and skin abrasions during handling.

Eye protection	Wear approved safety glasses, goggles, face shield and/or welder's helmet when risk of eye injury is present, particularly during operations that generate dust, mist or fume.
Skin and body protection	Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Protective overgarments or work clothing must be worn by persons who may become contaminated with particulate during activities. Skin contact with this material may cause, in some sensitive individuals, an allergic dermal response. Particulate that becomes lodged under the skin has the potential to induce sensitization and skin lesions.

9. Physical and chemical properties

Appearance

Physical state	Solid.
Form	Various shapes.
Color	Copper.
Odor	Not applicable.
Odor threshold	Not applicable.
pH	Not applicable.
Melting point/Freezing point	1981.4 °F (1083 °C) estimated
Boiling point, initial boiling point, and boiling range	4703 °F (2595 °C) estimated
Flash point	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not applicable.
Flammability limit - upper (%)	Not applicable.
Explosive limit - lower (%)	Not applicable.
Explosive limit - upper (%)	Not applicable.
Vapor pressure	0.79 hPa estimated
Vapor density	Not applicable.
Evaporation rate	Not applicable.
Specific gravity	8.82 estimated
Solubility(ies)	
Solubility (water)	Not applicable.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not applicable.
Viscosity (Coefficient of viscosity)	Not applicable.
Other information	
Density	8.82 g/cm ³ estimated
Flammability	Not applicable.
Relative density	Not applicable.

10. Stability and reactivity

Reactivity	Not available.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid dust formation. Contact with acids. Contact with alkalis.
Incompatible materials	Do not mix with other chemicals. None known.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Acute toxicity	May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause allergic skin reaction.
Skin corrosion/irritation	Not likely, due to the form of the product.
Serious eye damage/eye irritation	Harmful in contact with eyes.
Respiratory or skin sensitization	
ACGIH sensitization	
HARD METALS CONTAINING COBALT AND TUNGSTEN CARBIDE, THORACIC FRACTION, AS CO (CAS 7440-48-4)	Respiratory sensitization
Japan Society for Occupational Health: Respiratory sensitizer	
Beryllium (CAS 7440-41-7)	1 Known respiratory sensitizer.
Cobalt (CAS 7440-48-4)	1 Known respiratory sensitizer.
Nickel (CAS 7440-02-0)	2 Probable respiratory sensitizer.
Japan Society for Occupational Health: Skin sensitizer	
Beryllium (CAS 7440-41-7)	2 Probable skin sensitizer.
Cobalt (CAS 7440-48-4)	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	Due to lack of data the classification is not possible.
Carcinogenicity	Cancer hazard.
ACGIH Carcinogens	
Cobalt (CAS 7440-48-4)	A2 Suspected human carcinogen.
IARC Monographs. Overall Evaluation of Carcinogenicity	
Beryllium (CAS 7440-41-7)	1 Carcinogenic to humans.
Cobalt (CAS 7440-48-4)	2B Possibly carcinogenic to humans.
Lead (CAS 7439-92-1)	2B Possibly carcinogenic to humans.
Nickel (CAS 7440-02-0)	2B Possibly carcinogenic to humans.
Japan Society for Occupational Health: Carcinogen	
Beryllium (CAS 7440-41-7)	2A Probably carcinogenic to humans.
Cobalt (CAS 7440-48-4)	2B Possibly carcinogenic to humans.
Lead (CAS 7439-92-1)	2B Possibly carcinogenic to humans.
Reproductive toxicity	May damage fertility or the unborn child.
Specific target organ toxicity - single exposure	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Specific target organ toxicity - repeated exposure	May cause damage to organs (respiratory system) through prolonged or repeated exposure by inhalation.
Aspiration hazard	Due to lack of data the classification is not possible.
Other information	Symptoms may be delayed.

12. Ecological information

Ecotoxicity	Not available.
Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulation	Not available.
Mobility in soil	Not available.
Hazardous to the ozone layer	Not available.

13. Disposal considerations

Residual waste	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).
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Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Local disposal regulations Material should be recycled if possible. Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

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 available.

National regulations Follow regulation in section 15 for domestic transportation.

15. Regulatory information

Industrial Safety and Health Act

Specified substances regulation

Class 1 designated chemical substances

BERYLLIUM AND ITS COMPOUNDS

Class 2 designated chemical substances

COBALT

Cobalt and its inorganic compounds

NICKEL COMPOUNDS (POWDER, EXCLUDING

NICKEL CARBONYL (ITEM NO. 24))

Notifiable substances

BERYLLIUM AND ITS COMPOUNDS

Table 9 Ordinance No. VI 0.20 - 2.0 %

COBALT AND COBALT COMPOUNDS

Table 9 Ordinance No. 172 0 - 0.35 %

COPPER AND COPPER COMPOUNDS

Table 9 Ordinance No. 379 97 - 99 %

LEAD AND LEAD COMPOUNDS, INORGANIC

Table 9 Ordinance No. 411 0.20 - 0.60 %

NICKEL

Table 9 Ordinance No. 418 0 - 1.4 %

Labeling substances

BERYLLIUM AND ITS COMPOUNDS

0.20 - 2.0 %

COBALT (POWDER)

0 - 0.35 %

COBALT AND COBALT COMPOUNDS

0 - 0.35 %

COPPER (POWDER)

97 - 99 %

COPPER AND COPPER COMPOUNDS

97 - 99 %

LEAD (POWDER)

0.20 - 0.60 %

LEAD AND LEAD COMPOUNDS, INORGANIC

0.20 - 0.60 %

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)

BERYLLIUM AND ITS COMPOUNDS	Ordinance No. 394	2.0 %	(Beryllium)
NICKEL COMPOUNDS	Ordinance No. 309	1.4 %	(Nickel)

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

COBALT AND ITS COMPOUNDS	Ordinance No. 132	0.35 %	(Cobalt)
LEAD	Ordinance No. 304	0.60 %	(Lead)
NICKEL	Ordinance No. 308	1.4 %	(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.

Waste Management and Public Cleansing Act

DUST CONTAINING LEAD AND ITS COMPOUNDS
SLUDGE, SPENT ACID, AND WASTE ALKALI CONTAINING LEAD AND ITS COMPOUNDS

Water Pollution Control Act

COPPER
LEAD AND ITS COMPOUNDS (TOTAL PB)

Air Pollution Control Act

LEAD AND ITS COMPOUNDS-BAKING FURNACE AND SMELTING FURNACE FOR MANUFACTURING GLASS USING LEAD OXIDES AS RAW MATERIALS
LEAD AND ITS COMPOUNDS-CALCINATION FURNACE, CONVERTER, SMELTING FURNACE AND DRYING FURNACE FOR REFINING COPPER, LEAD OR ZINC
LEAD AND ITS COMPOUNDS-SINTERING FURNACE AND BLAST FURNACE FOR REFINING COPPER, LEAD OR ZINC
LEAD AND ITS COMPOUNDS-SMELTING FURNACE, ETC., FOR SECONDARY REFINING OF LEAD FOR MANUFACTURING LEAD PIPE, SHEET, WIRE, LEAD STORAGE BATTERY OR LEAD PIGMENT

Sewage Act

COPPER AND ITS COMPOUNDS (AS CU)	3 MG/L
LEAD AND ITS COMPOUNDS (AS PB)	0.1 MG/L

16. Other information

Further information Transportation Emergency
Call Chemtrec at:
Domestic: 800.424.9300
International: 703.527.3887

This document has been prepared using data from sources considered to be technically reliable and the information is believed to be correct. Materion makes no warranties, expressed or implied, as to the accuracy of the information contained herein. Materion cannot anticipate all conditions under which this information and its products may be used and the actual conditions of use are beyond its control. The user is responsible to evaluate all available information when using this product for any particular use and to comply with all Federal, State, Provincial and Local laws, statutes and regulations.

Other information Revised information in Section 2.
Revised information in Section 4.
Revised information in Section 8.