



**MATERION**

Product name: M-25 and M-65 Alloys

# CHEMICAL PRODUCT SAFETY DATA SHEET

Prepared in accordance with GB/T 16483 and GB/T 17519.

Issue date: 08-11-2015  
Revision date: 04-19-2021  
Version #: 04  
SDS No: A01

## SECTION 1 Chemical product and company identification

Chinese name of chemical	M-25 and M-65 合金
English name of chemical	M-25 and M-65 Alloys
Synonyms	C17300 (M-25), C17465 (M-65), Copper Beryllium Alloy, Beryllium Copper Alloy, Copper Alloy
Manufacturer/Supplier	Materion Brush Inc.
Address	6070 Parkland Boulevard Mayfield Heights, OH 44124 United States
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Emergency telephone number	+1.216.383.4019
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## SECTION 2 Hazards identification

Emergency overview	<b>DANGER</b>  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 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.
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### GHS hazard categories

Physical hazards	Not classified.
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 Category 1A Specific target organ toxicity, repeated exposure Category 1 (Respiratory system)
Environmental hazards	Not classified.

### Label elements

#### Pictograms



#### Signal word

Danger

#### Hazard statement

H301	Toxic if swallowed.
H317	May cause an allergic skin reaction.
H330	Fatal if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H350i	May cause cancer by inhalation.
H372	Causes damage to organs (respiratory system) through prolonged or repeated exposure.

**Precautionary statement****Prevention**

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P264	Wash 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.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P285	In case of inadequate ventilation wear respiratory protection.

**Response**

P302 + P350	If on skin: Wash with plenty of water.
P308 + P311	If exposed or concerned: Call a poison center/doctor.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P342 + P311	If experiencing respiratory symptoms: Call a poison center/doctor.
P362 + P364	Take off contaminated clothing and wash it before reuse.

**Storage**

P405	Store locked up.
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**Disposal**

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.
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**Physical and chemical hazards**

The product is stable and non-reactive under normal conditions of use, storage and transport. No unusual fire or explosion hazards noted.

**Health hazards**

Fatal if inhaled. Toxic if swallowed. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

**Environmental hazards**

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Supplemental information**

Exposure to the elements listed in Section 3 by inhalation, ingestion, and skin contact can occur when melting, casting, dross 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.

**SECTION 3 Composition/information on ingredients**

Substance/mixture	Mixture	Concentration (%)	CAS Number
铜		97.1 - 98.6	7440-50-8
Copper			
铍		0.2 - 2	7440-41-7
Beryllium			
镍		0 - 1.4	7440-02-0
Nickel			
铅		0.2 - 0.6	7439-92-1
Lead			
钴		0 - 0.35	7440-48-4
Cobalt			

## SECTION 4 First aid measures

<b>Inhalation</b>	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.
<b>Skin contact</b>	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.
<b>Eye contact</b>	Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if symptoms persist.
<b>Ingestion</b>	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.
<b>Most important symptoms and health effects</b>	May cause allergic skin reaction. May cause allergic respiratory reaction. Prolonged exposure may cause chronic effects.
<b>Personal protection for first-aid responders</b>	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.
<b>Notes to physician</b>	<p>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.</p> <p>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."</p>

## SECTION 5 Fire-fighting measures

<b>Extinguishing media</b>	The product is non-combustible. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
<b>Extinguishing media to avoid</b>	Do not use water to extinguish fires around operations involving molten metal due to the potential for steam explosions.
<b>Specific hazards</b>	None.
<b>Special fire fighting procedures</b>	Move containers from fire area if you can do so without risk. Water runoff can cause environmental damage.
<b>Protection of fire-fighters</b>	Firefighters should wear full protective clothing including self contained breathing apparatus. Wear suitable protective equipment.
<b>Specific methods</b>	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.

## SECTION 6 Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	
<b>For non-emergency personnel</b>	In solid form this material poses no special clean-up problems. Wear appropriate protective equipment and clothing during clean-up.
<b>For emergency responders</b>	Not available.

**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.

**Clean-up methods and materials and containment measures** Clean up in accordance with all applicable regulations.

**Prevention of secondary hazards** Not available.

## SECTION 7 Handling and storage

**Handling** Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Do not breathe dust/fume. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection. Wash thoroughly after handling. When using, do not eat, drink or smoke. Contaminated work clothing must not be allowed out of the workplace.

**Storage** Keep locked-up. Avoid contact with acids and alkalis. Avoid contact with oxidizing agents.

## SECTION 8 Exposure controls/personal protection

### Exposure limits

China OELs. Occupational Exposure Limits for Hazardous Agents in the Workplace, Chemical Hazardous Agents (GBZ 2.1-2007)

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	PC-STEL	0.001 mg/m <sup>3</sup>	
	PC-TWA	0.0005 mg/m <sup>3</sup>	
Cobalt (CAS 7440-48-4)	PC-STEL	0.1 mg/m <sup>3</sup>	
	PC-TWA	0.05 mg/m <sup>3</sup>	
Copper (CAS 7440-50-8)	PC-TWA	1 mg/m <sup>3</sup>	Dust.
		0.2 mg/m <sup>3</sup>	Fume.
Lead (CAS 7439-92-1)	PC-TWA	0.05 mg/m <sup>3</sup>	Dust.
		0.03 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	PC-TWA	1 mg/m <sup>3</sup>	

### Biological limit values

China. Biological limit values for occupational exposure (WS/T 110 to 115, 239 to 243, and 264 to 267)

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	400 µg/l	Lead	Blood	*
	2 µmol/l	Lead	Blood	*

\* - 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)	200 µg/l	Lead	Blood	*

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

### Exposure guidelines

China OELs. Occupational Exposure Limits for Hazardous Agents in the Workplace, Chemical Hazardous Agents (GBZ 2.1-2007): Skin designation

BERYLLIUM AND COMPOUNDS, AS BE (CAS 7440-41-7) Can be absorbed through the skin.

**Monitoring methods**

**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.

**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.

**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.

**Engineering measures**

Ensure adequate ventilation, especially in confined areas.

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.

**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.

**Hygiene measures**

Handle in accordance with good industrial hygiene and safety practice.

**SECTION 9 Physical and chemical properties****Appearance**

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

## SECTION 10 Stability and reactivity

<b>Stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	Avoid dust formation. Contact with acids. Contact with alkalis.
<b>Incompatible materials</b>	Do not mix with other chemicals. None known.
<b>Hazardous decomposition products</b>	No hazardous decomposition products are known.

## SECTION 11 Toxicological information

<b>Acute toxicity</b>	May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause allergic skin reaction.
<b>Routes of exposure</b>	Inhalation. Ingestion. Skin contact. Eye contact.
<b>Symptoms</b>	Respiratory disorder.
<b>Skin corrosion/irritation</b>	Not likely, due to the form of the product.
<b>Serious eye damage/eye irritation</b>	Harmful in contact with eyes.
<b>Respiratory or skin sensitization</b>	
<b>Respiratory sensitization</b>	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
<b>Skin sensitizer</b>	May cause an allergic skin reaction.

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**Germ cell mutagenicity** Due to lack of data the classification is not possible.

**Carcinogenicity** Cancer hazard.

**China OELs for hazardous agents in the workplace: Carcinogen Category**

BERYLLIUM AND COMPOUNDS, AS BE (CAS 7440-41-7)	Carcinogenic to humans.
COBALT AND OXIDES, AS CO (CAS 7440-48-4)	Possible human carcinogen.
LEAD, DUST, AS PB (CAS 7439-92-1)	Possible human carcinogen.
NICKEL METAL (CAS 7440-02-0)	Possible 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.

**Toxic to reproduction** May damage fertility or the unborn child.

**Specific target organ toxicity following single exposure** May cause allergy or asthma symptoms or breathing difficulties if inhaled.

**Specific target organ toxicity following 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.

**Chronic effects** May cause damage to organs through prolonged or repeated exposure. Contains lead. Danger of cumulative effects (may cause damage to blood, kidneys and the nervous system).

**Other information** Symptoms may be delayed.

## SECTION 12 Ecological information

### Ecotoxicological data

Components		Species	Test Results
Copper (CAS 7440-50-8)			
<b>Aquatic</b>			
<i>Acute</i>			
Crustacea	EC50	Blue crab ( <i>Callinectes sapidus</i> )	0.0031 mg/l
Fish	LC50	Fathead minnow ( <i>Pimephales promelas</i> )	0.0219 - 0.0446 mg/l, 96 hours
Nickel (CAS 7440-02-0)			
<b>Aquatic</b>			
<i>Acute</i>			
Fish	LC50	Rainbow trout, donaldson trout ( <i>Oncorhynchus mykiss</i> )	0.06 mg/l, 4 days

\* Estimates for product may be based on additional component data not shown.

**Ecotoxicity** Not available.

**Persistence and degradability** No data is available on the degradability of this product.

**Bioaccumulation** Not available.

**Mobility in soil** Not available.

**Other hazardous effects** Not available.

## SECTION 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).

**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.

## SECTION 14 Transport information

### CNDG

Not regulated as dangerous goods.

### 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.

## SECTION 15 Regulatory information

### Law of the People's Republic of China on Prevention and Control of Occupational Diseases

#### Classification of occupational disease hazards

BERYLLIUM AND ITS COMPOUNDS (CAS 7440-41-7)

COBALT AND ITS OXIDES (CAS 7440-48-4)

COPPER AND ITS COMPOUNDS (CAS 7440-50-8)

LEAD AND ITS COMPOUNDS (EXCLUDING TETRAETHYL LEAD) (CAS 7439-92-1)

### Regulations on the Control over Safety of Dangerous Chemicals

#### Catalog of Hazardous Chemicals

BERYLLIUM POWDER (CAS 7440-41-7)

### Regulations on Labor Protection in Workplaces Where Toxic Substances Are Used

#### Directory of Highly Toxic Substances

Beryllium (CAS 7440-41-7)

Lead (CAS 7439-92-1)

Nickel (CAS 7440-02-0)

### Provision on the Environmental Administration of New Chemical Substances

#### China Inventory of Existing Chemical Substances

Country(s) or region	Inventory name	On inventory (yes/no)*
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)  
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

### Other regulations

This safety data sheet conforms to the following laws, regulations and standards:  
Regulations on the Control over Safety of Dangerous Chemicals  
Regulations on Labor Protection in Workplaces Where Toxic Products Are Used  
Measures for the Safe Use of Chemicals in Workplaces  
Safety Data Sheet for Chemical Products - Content and Order of Sections (GB/T 16483-2008)  
General Rules for Preparation of Precautionary Labels for Chemicals (GB15258-2009 )  
Packing Symbol of Dangerous Goods(GB190-2009)  
Packing - Pictorial Marking for Handling of Goods (GB/T191-2009)

#### China. National Catalogue of Hazardous Wastes

Lead (CAS 7439-92-1)

### International regulations

#### Stockholm Convention

Not applicable.

#### Rotterdam Convention

Not applicable.

#### Montreal Protocol

Not applicable.



**Kyoto protocol**

Not applicable.

**Basel Convention**

Not applicable.

**SECTION 16 Other information****References**

Not available.

**Further information**

Transportation Emergency

Call Chemtrec at:

International: 703.741.5970

Spain: 900.868.538

Switzerland: 0800.564.402

Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059

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**Other information**

Revised information in Section 16.