PRODUCT INFORMATION SHEET

MATERION

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Registration number -

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

1.1. Product identifier

Trade name or designation of the mixture M-25 and M-65 Alloys

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

Identified uses
Industrial uses: Uses of substances as such or in preparations at industrial sites
Offshore industries
Manufacture of basic metals, including alloys
Manufacture of computer, electronic and optical products, electrical equipment
General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
Electricity, steam, gas water supply and sewage treatment
Scientific research and development
Other: Manufacture of medical and defense equipment

Uses advised against None known.

1.3. Details of the supplier of the product information sheet

Materion Brush Inc.
6070 Parkland Boulevard
Mayfield Heights, OH 44124
United States
ehs@materion.com
www.materion.com
+1.216.383.4019

Document number A01

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classificatior applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Health hazards

Acute toxicity, oral	Category 4	H302 - Harmful if swallowed.
Acute toxicity, inhalation	Category 4	H332 - Harmful if inhaled.
Respiratory sensitisation	Category 1	H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation	Category 1	H317 - May cause an allergic skin reaction.
Carcinogenicity	Category 1B	H350 - May cause cancer.
Reproductive toxicity (fertility, the unborn child)	Category 1A	H360FD - May damage fertility. May damage the unborn child.
Specific target organ toxicity - repeated exposure	Category 1 (Respiratory system)	H372 - Causes damage to organs (respiratory system) through prolonged or repeated exposure by inhalation.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Beryllium, Cobalt, Copper, Lead, Nickel

Hazard pictograms

Signal word Danger

Hazard statements

H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.
H372	Causes damage to organs (respiratory system) through prolonged or repeated exposure by inhalation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H350	May cause cancer.
H360FD	May damage fertility. May damage the unborn child.

Precautionary statements

Prevention

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/vapours/spray.
P261	Avoid breathing dust.
P264	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P284	Wear respiratory protection.

Response

P301 + P312	IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell.
P330	Rinse mouth.
P302 + P350	If on skin: Wash with plenty of water.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308 + P311	If exposed or concerned: Call a poison centre/doctor.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P342 + P311	If experiencing respiratory symptoms: Call a poison centre/doctor.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Storage

P405	Store locked up.

Disposal

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental label information

Restricted to professional users.
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.

2.3. Other hazards

This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII. The mixture does not contain any substances included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties at a concentration equal to or greater than 0.1% by weight.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Copper	97,1 - 98,6	7440-50-8 231-159-6	01-2119480154-42-0000	-	

Classification: -

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Beryllium	0,2 - 2	7440-41-7 231-150-7	01-2119487146-32-0000	004-001-00-7	#
Classification:	Skin Sens. 1;H317, Carc. 1B;H350i, STOT SE 3;H335, STOT RE 1;H372				
Nickel	0 - 1,4	7440-02-0 231-111-4	01-2119438727-29-0001	028-002-00-7	
Classification:	Skin Sens. 1;H317, Carc. 2;H351, STOT SE 3;H335, STOT RE 2;H373				
Lead	0,2 - 0,6	7439-92-1 231-100-4	-	082-014-00-7	#
Classification:	Acute Tox. 4;H302, Acute Tox. 4;H332, Carc. 2;H351, Repr. 1A;H360FD, STOT RE 2;H373				
Specific Concentration Limits:	STOT RE 2;H373: C ≥ 0.5 %				
Cobalt	0 - 0,35	7440-48-4 231-158-0	01-2119517392-44-0000	027-001-00-9	
Classification:	Acute Tox. 4;H302;(ATE: 500 mg/kg bw), Resp. Sens. 1;H334, Skin Sens. 1;H317, Carc. 1B;H350, Repr. 2;H361				

List of abbreviations and symbols that may be used above

DSD: Directive 67/548/EEC.
CLP: Regulation No. 1272/2008.
ATE: Acute toxicity estimate.
M: M-factor
vPvB: very persistent and very bioaccumulative substance.
PBT: persistent, bioaccumulative and toxic substance.
#: This substance has been assigned Union workplace exposure limit(s).
All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition comments The full text for all H-statements is displayed in section 16.

SECTION 4: First aid measures

General information If exposed or concerned: get medical attention/advice. 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.

4.1. Description of first aid measures

Inhalation 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 breathing has stopped, perform artificial respiration and obtain medical help.

Skin contact 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.

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

Ingestion 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. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed May cause allergic respiratory reaction. Difficulty in breathing. May cause an allergic skin reaction. Dermatitis. Rash. Prolonged exposure may cause chronic effects.

4.3. Indication of any immediate medical attention and special treatment needed

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."

The effects of continued low exposure to beryllium are unknown for individuals who are sensitizec to beryllium or who have a diagnosis of chronic beryllium disease. It is generally recommended that persons who are sensitized to beryllium or who have CBD terminate their occupational exposure to beryllium.

SECTION 5: Firefighting measures

General fire hazards No unusual fire or explosion hazards noted.

5.1. Extinguishing media

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

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

5.2. Special hazards arising from the substance or mixture During fire, gases hazardous to health may be formed.

5.3. Advice for firefighters

Special protective equipment for firefighters Firefighters should wear full protective clothing including self contained breathing apparatus.

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

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.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel Avoid inhalation of dust. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Wear appropriate personal protective equipment.

For emergency responders Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Avoid inhalation of dust. Local authorities should be advised if significant spillages cannot be contained. Use personal protection recommended in Section 8 of the Product Information Sheet. As supplied, this product poses no special release issues.

6.2. Environmental precautions In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

6.3. Methods and material for containment and cleaning up Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Clean up in accordance with all applicable regulations.

6.4. Reference to other sections For personal protection, see section 8 of the Product Information Sheet. For waste disposal, see section 13 of the Product Information Sheet. For personal protection, see section 8 of the PIS. For waste disposal, see section 13 of the PIS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimise dust generation and accumulation. Do not breathe dust/fume. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection. Do not taste or swallow. Avoid breathing dust. 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. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Wash thoroughly after handling. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store locked up. Store in tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the Product Information Sheet). Avoid contact with acids and alkalies. Avoid contact with oxidising agents.

7.3. Specific end use(s)

Observe industrial sector guidance on best practices.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Austria. MAK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001, as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	MAK	0,0006 mg/m3	Inhalable fraction.
	STEL	0,0002 mg/m3	Inhalable fraction.
Copper (CAS 7440-50-8)	MAK	1 mg/m3	Inhalable fraction.
		0,1 mg/m3	Fume and respirable dust.
	STEL	4 mg/m3	Inhalable fraction.
		0,4 mg/m3	Fume and respirable dust.
Lead (CAS 7439-92-1)	MAK	0,1 mg/m3	Inhalable fraction.
	STEL	0,4 mg/m3	Inhalable fraction.

Austria. OELs. TRK List, Grenzwerteverordnung, BGBl. II, no. 429/2011, as amended

Components	Type	Value	Form
Cobalt (CAS 7440-48-4)	STEL	0,4 mg/m3	Inhalable fraction.
	TWA	0,1 mg/m3	Inhalable fraction.
Nickel (CAS 7440-02-0)	STEL	2 mg/m3	Inhalable dust.
	TWA	0,5 mg/m3	Inhalable dust.

Belgium. OEL. Exposure Limit Values to Chemical Substances at Work, Code of Well-being at work, Book VI, Title 1 - Chemical agents, as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	STEL	0,01 mg/m3	
	TWA	0,00005 mg/m3	
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	Dust and fume.
		0,005 mg/m3	Thoracic fraction.
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0,2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3	Dust and fume.
Nickel (CAS 7440-02-0)	TWA	1 mg/m3	

Bulgaria. OEL values of carcinogens and mutagens at work (Reg. 10/2003 on prot. from carcinogens and mutagens at work, Ann. 1), as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0002 mg/m3	Inhalable fraction.

Bulgaria. OELs. Ordinance No 13 on protection of workers against risks of exposure to chemical agents at work, as amended

Components	Type	Value
Cobalt (CAS 7440-48-4)	TWA	0,1 mg/m3
Copper (CAS 7440-50-8)	TWA	0,1 mg/m3
Lead (CAS 7439-92-1)	TWA	0,05 mg/m3

Bulgaria. OELs. Ordinance No 13 on protection of workers against risks of exposure to chemical agents at work, as amended

Components	Type	Value
Nickel (CAS 7440-02-0)	TWA	0,05 mg/m3

Croatia. OELs (GVI). Regulation on Protection of Workers against Exposure to Dangerous Chemicals at Work, OELs and Biological Limit Values, Annex I (NN 91/2018), as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	MAC	0,0006 mg/m3	
Cobalt (CAS 7440-48-4)	MAC	0,1 mg/m3	
Copper (CAS 7440-50-8)	MAC	1 mg/m3	
		0,2 mg/m3	Dust.
	STEL	2 mg/m3	
Lead (CAS 7439-92-1)	MAC	0,15 mg/m3	
Nickel (CAS 7440-02-0)	MAC	0,5 mg/m3	

Cyprus. OELs. Control of factory atmosphere and dangerous substances in factories regulation, PI 311/73, as amended

Components	Type	Value	Form
Cobalt (CAS 7440-48-4)	TWA	0,1 mg/m3	Dust and fume.
Copper (CAS 7440-50-8)	TWA	0,2 mg/m3	Fume.
Nickel (CAS 7440-02-0)	TWA	1 mg/m3	

Czech Republic. Occupational exposure limit values of chemicals at work (Decree on protection of health at work, 361/2007, Annex 2, Part A & Annex 3, Part A, as amended)

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	Ceiling	0,002 mg/m3	
		0,002 mg/m3	Aerosol, inhalable.
	TWA	0,0006 mg/m3	Aerosol, inhalable.
		0,0002 mg/m3	
Cobalt (CAS 7440-48-4)	Ceiling	0,1 mg/m3	Aerosol, inhalable.
	TWA	0,05 mg/m3	Aerosol, inhalable.
Copper (CAS 7440-50-8)	Ceiling	2 mg/m3	Aerosol, inhalable.
		0,2 mg/m3	Respirable aerosol fraction
	TWA	1 mg/m3	Aerosol, inhalable.
		0,1 mg/m3	Respirable aerosol fraction
Lead (CAS 7439-92-1)	Ceiling	0,2 mg/m3	
	TWA	0,05 mg/m3	
Nickel (CAS 7440-02-0)	Ceiling	1 mg/m3	Aerosol, inhalable.
	TWA	0,5 mg/m3	Aerosol, inhalable.

Denmark. Work Environment Authority. Exposure Limits for Substances & Materials, Annex 2

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TLV	0,00002 mg/m3	
Cobalt (CAS 7440-48-4)	TLV	0,01 mg/m3	Dust and fume.
Copper (CAS 7440-50-8)	TLV	1 mg/m3	Dust.
		0,1 mg/m3	Fume.
Lead (CAS 7439-92-1)	TLV	0,05 mg/m3	Dust and fume.
Nickel (CAS 7440-02-0)	TLV	0,05 mg/m3	Dust.

Estonia. OELs. Occupational Exposure Limits of Hazardous Substances (Regulation No. 105/2001, Annex), as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Inhalable fraction.
Cobalt (CAS 7440-48-4)	TWA	0,05 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Total dust.
		0,2 mg/m3	Fine dust.

Estonia. OELs. Occupational Exposure Limits of Hazardous Substances (Regulation No. 105/2001, Annex), as amended

Components	Type	Value	Form
Lead (CAS 7439-92-1)	TWA	0,1 mg/m3	Total dust, respiratory fraction
		0,05 mg/m3	Fine dust, respiratory fraction
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m3	

Finland. Government Decree on Work-related Cancer Risks

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Respirable dust.

Finland. HTP-arvot, App 3., Binding Limit Values, Social Affairs and Ministry of Health

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	STEL	0,004 mg/m3	
	TWA	0,0001 mg/m3	
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	
Copper (CAS 7440-50-8)	TWA	0,02 mg/m3	Respirable.
		0,02 mg/m3	Respirable dust and/or fume.
Lead (CAS 7439-92-1)	TWA	0,1 mg/m3	
Nickel (CAS 7440-02-0)	TWA	0,01 mg/m3	Respirable.

France. OELs. Occupational Exposure Limits as Prescribed by Art. R.4412-149 of Labor Code, as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	VME	0,0006 mg/m3	Inhalable fraction.
Lead (CAS 7439-92-1)	VME	0,1 mg/m3	

France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	VME	0,0006 mg/m3	Inhalable fraction.
Regulatory status: Regulatory binding (VRC)			
Copper (CAS 7440-50-8)	VLE	2 mg/m3	Dust.
Regulatory status: Indicative limit (VL)			
	VME	1 mg/m3	Dust.
Regulatory status: Indicative limit (VL)			
		0,2 mg/m3	Fume.
Regulatory status: Indicative limit (VL)			
Lead (CAS 7439-92-1)	VME	0,1 mg/m3	
Regulatory status: Regulatory binding (VRC)			
Nickel (CAS 7440-02-0)	VME	1 mg/m3	
Regulatory status: Indicative limit (VL)			

Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG), as updated

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	0,01 mg/m3	Respirable fraction.
Lead (CAS 7439-92-1)	TWA	0,004 mg/m3	Inhalable fraction.

Germany. TRGS 900, Limit Values in the Ambient Air at the Workplace

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	AGW	0,00014 mg/m3	Inhalable fraction.
		0,00006 mg/m3	Respirable fraction.
Nickel (CAS 7440-02-0)	AGW	0,03 mg/m3	Inhalable fraction.
		0,006 mg/m3	Respirable fraction.

Greece. OELs, Presidential Decree No. 307/1986, as amended

Components	Type	Value	Form
Cobalt (CAS 7440-48-4)	TWA	0,1 mg/m3	Dust and fume.

Greece. OELs, Presidential Decree No. 307/1986, as amended

Components	Type	Value	Form
Copper (CAS 7440-50-8)	STEL	2 mg/m3	Dust.
	TWA	1 mg/m3	Dust.
		0,2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1 mg/m3	

Hungary. OELs. Decree on protection of workers exposed to chemical agents (5/2020. (II.6)), Annex 1&2, as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	
Copper (CAS 7440-50-8)	STEL	0,2 mg/m3	
Lead (CAS 7439-92-1)	TWA	0,1 mg/m3	
		0,05 mg/m3	Respirable.

Iceland. OELs. Regulation 390/2009 on Pollution Limits and Measures to Reduce Pollution at the Workplace, as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0002 mg/m3	Inhalable fraction.
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	Dust and fume.
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Total dust.
		0,1 mg/m3	Respirable dust.
Lead (CAS 7439-92-1)	TWA	0,05 mg/m3	Dust and fume.
Nickel (CAS 7440-02-0)	TWA	0,05 mg/m3	Dust.

Ireland. OELVs, Schedules 1 & 2, Code of Practice for Chemical Agents and Carcinogens Regulations

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Inhalable fraction.
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0,2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3	
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m3	

Italy. OELs (Legislative Decree n.81, 9 April 2008), as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Inhalable fraction.
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	Inhalable fraction.
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.
		0,2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0,05 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1,5 mg/m3	Inhalable fraction.

Latvia. OELs. Occupational Exposure Limits of Chemical Substances at Workplace (Reg. No. 325/ 2007, L.V. 80, Annex 1), as amended

Components	Type	Value
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3
Cobalt (CAS 7440-48-4)	TWA	0,5 mg/m3
Copper (CAS 7440-50-8)	STEL	1 mg/m3
	TWA	0,5 mg/m3
Lead (CAS 7439-92-1)	STEL	0,1 mg/m3
	TWA	0,05 mg/m3
Nickel (CAS 7440-02-0)	TWA	0,05 mg/m3

Lithuania. OELs. Occupational Exposure Limit Values for Chemical Substances (Hygiene Norm HN 23:2011; Order No. V-824/A1-389), as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Inhalable fraction.
		0,0006 mg/m3	
Cobalt (CAS 7440-48-4)	TWA	0,05 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Inhalable fraction.
		0,2 mg/m3	Respirable fraction.
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3	Inhalable fraction.
		0,07 mg/m3	Respirable fraction.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m3	

Luxembourg. OELs. Binding Occupational Exposure Limit Values (Annex I), G.D.R. of 14 November 2016, OJ Memorial A, n ° 235/2016, as amended

Components	Type	Value
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3

Malta. OELs. Protection of Health and Safety of Workers from Risks related to Chemical Agents at Work (L.N 227/2003 Schedules I and V), as amended

Components	Type	Value
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3

Netherlands. OELs per Annex XIII of Working Conditions Regulation (Staatscourant no. 252, 29 December 2006), as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	Dust and fume.
Copper (CAS 7440-50-8)	TWA	0,1 mg/m3	Inhalable fraction.
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3	

Norway. Regulation No. 1358 on Measures and Limit Values for Physical and Chemical Factors in Work Environment and Infection Groups for Biological Factors, as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	STEL	0,0002 mg/m3	Inhalable
	TLV	0,00002 mg/m3	Inhalable
Copper (CAS 7440-50-8)	TLV	1 mg/m3	Dust.
		0,1 mg/m3	Fume.
Lead (CAS 7439-92-1)	TLV	0,05 mg/m3	Dust and fume.
Nickel (CAS 7440-02-0)	TLV	0,05 mg/m3	

Poland. Maximum permissible concentrations and intensities of harmful factors in the work environment (Dz.U.Poz. 1286/2018, Annex 1)

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0002 mg/m3	Inhalable fraction.
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	
Copper (CAS 7440-50-8)	TWA	0,2 mg/m3	
Lead (CAS 7439-92-1)	TWA	0,05 mg/m3	Inhalable fraction.
Nickel (CAS 7440-02-0)	TWA	0,25 mg/m3	

Portugal. Decree-Law No. 24/2012, Binding Occupational Exposure Limit Values, Annex I (Diário da República - I.a série - No. 26), an amended

Components	Type	Value
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3

Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796-2014)

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Inhalable fraction.
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Dust and mist.

Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796-2014)

Components	Type	Value	Form
		0,2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0,05 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1,5 mg/m3	Inhalable fraction.

Romania. OELs. Limit Values of Chemical Agents at Workplace (Regulation 1.218/2006, M.O 845, Annex 1, 3&4, as amended)

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Inhalable fraction.
Cobalt (CAS 7440-48-4)	STEL	0,1 mg/m3	
	TWA	0,05 mg/m3	
Copper (CAS 7440-50-8)	STEL	1,5 mg/m3	Dust.
		0,2 mg/m3	Fume.
	TWA	0,5 mg/m3	Dust.
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3	
Nickel (CAS 7440-02-0)	STEL	0,5 mg/m3	
	TWA	0,1 mg/m3	

Slovakia. OELs for carcinogens and mutagens. Regulation No. 356/2006 on carcinogenic and mutagenic substances, as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Inhalable fraction.
Nickel (CAS 7440-02-0)	TWA	0,05 mg/m3	Inhalable fraction.

Slovakia. OELs. Maximum permissible exposure limits for chemical factors in workplace air (Regulation No 355/2006, Annex 1, Table 1, as amended)

Components	Type	Value	Form
Cobalt (CAS 7440-48-4)	TWA	0,05 mg/m3	
Copper (CAS 7440-50-8)	TWA	1 mg/m3	Inhalable fraction.
		0,2 mg/m3	Respirable fume.
Lead (CAS 7439-92-1)	TWA	0,5 mg/m3	Inhalable fraction.
		0,15 mg/m3	Respirable fraction.

Slovenia. OELs. Occupational Exposure Limits of Chemicals at Workplace (Reg. on Protection of Workers from Risks due to Exp. to Chemicals at Work, Ann. I 100/2001), as amended

Components	Type	Value	Form
Lead (CAS 7439-92-1)	KTV	0,4 mg/m3	Inhalable fraction.
Nickel (CAS 7440-02-0)	KTV	0,048 mg/m3	Respirable fraction.

Slovenia. OELs. Occupational Exposure Limits of Chemicals at Workplace (Reg. on Protection of Workers from Risks due to Exp. to Chemicals at Work, Annex I), as amended

Components	Type	Value	Form
Lead (CAS 7439-92-1)	TWA	0,1 mg/m3	Inhalable fraction.
Nickel (CAS 7440-02-0)	TWA	0,006 mg/m3	Respirable fraction.

Spain. OELs. INSST, Límites de Exposición Profesional Para Agentes Químicos, Table 1-Valores Límites Ambientales (VLAs)

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0002 mg/m3	
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	
Copper (CAS 7440-50-8)	TWA	0,01 mg/m3	Respirable fraction.
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3	
Nickel (CAS 7440-02-0)	TWA	1 mg/m3	

Sweden. OELs (Annex 1). Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2018:1), as amended

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0006 mg/m3	Inhalable fraction.

Sweden. OELs (Annex 1). Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2018:1), as amended

Components	Type	Value	Form
Cobalt (CAS 7440-48-4)	TWA	0,02 mg/m3	Inhalable dust.
Copper (CAS 7440-50-8)	TWA	0,01 mg/m3	Respirable dust.
Lead (CAS 7439-92-1)	TWA	0,1 mg/m3	Inhalable dust.
		0,05 mg/m3	Respirable dust.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m3	Total dust.

Switzerland. SUVA Grenzwerte am Arbeitsplatz: Aktuelle MAK-Werte

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,002 mg/m3	Inhalable fraction.
Cobalt (CAS 7440-48-4)	TWA	0,05 mg/m3	Inhalable fraction.
Copper (CAS 7440-50-8)	STEL	0,2 mg/m3	Inhalable fraction.
	TWA	0,1 mg/m3	Inhalable fraction.
Lead (CAS 7439-92-1)	STEL	0,8 mg/m3	Inhalable fraction.
	TWA	0,1 mg/m3	Inhalable fraction.
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m3	Inhalable fraction.

UK. OELs. Workplace Exposure Limits (WELs) (EH40/2005 (Fourth Edition 2020)), Table 1

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,002 mg/m3	
Cobalt (CAS 7440-48-4)	TWA	0,1 mg/m3	
Copper (CAS 7440-50-8)	STEL	2 mg/m3	Inhalable dusts and mists.
	TWA	1 mg/m3	Inhalable dusts and mists.
		0,2 mg/m3	Fume.
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3	
Nickel (CAS 7440-02-0)	TWA	0,5 mg/m3	

EU. Directive 98/24/EC: on the protection of workers from the risks related to chemical agents at work, Annex I List of Binding Occupational Exposure Limit Values

Components	Type	Value
Lead (CAS 7439-92-1)	TWA	0,15 mg/m3

EU. OELs, Directive 2004/37/EC on carcinogen and mutagens from Annex III, Part A

Components	Type	Value	Form
Beryllium (CAS 7440-41-7)	TWA	0,0002 mg/m3	Inhalable fraction.

Biological limit values

Croatia. BELs (BGV). Regulation on Protection of Workers against Exposure to Dangerous Chemicals at Work, OELs and BELs, Annex IV (NN 91/2018), as amended

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	300 µg/l	Lead	Blood	*
	1,5 mg/l	Protoporphyrin	Blood	*
	15 u/l	Dehydratase δ-aminolevulinic acid	Blood	*
	400 ug/l	Lead	Blood	*
	2,67 umol/l	Protoporphyrin	Blood	*

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

Czech Republic. BELs. Government Decree 432/2003 Sb., as amended

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	0,035 µmol/mmol	Coproporphyrin	Creatinine in urine	*
	0,2 mg/g	Coproporphyrin	Creatinine in urine	*
	0,4 mg/l	Lead	Blood	*

Czech Republic. BELs. Government Decree 432/2003 Sb., as amended

Components	Value	Determinant	Specimen	Sampling Time
Nickel (CAS 7440-02-0)	0,077 µmol/mmol	Nickel	Creatinine in urine	*
	0,04 mg/g	Nickel	Creatinine in urine	*

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

Finland. HTP-arvot, App 2., Biological Limit Values, Social Affairs and Ministry of Health

Components	Value	Determinant	Specimen	Sampling Time
Cobalt (CAS 7440-48-4)	130 nmol/l	Cobalt	Urine	*
Lead (CAS 7439-92-1)	1,4 umol/l	Lead	Blood	*
Nickel (CAS 7440-02-0)	0,1 umol/l	Nickel	Urine	*

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

France. BELs. Biological Exposure Limits according to Art. R.4412-152 of Labor Code, created by Art. V of Decree No. 2008-244, as amended

Components	Value	Determinant	Specimen
Lead (CAS 7439-92-1)	300 µg/l	Lead	Blood

France. Biological indicators of exposure (IBE) (National Institute for Research and Security (INRS), ND 2065)

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

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

Germany. TRGS 903, BAT List (Biological Limit Values)

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	150 µg/l	Blei	Blood	*

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

Hungary. BELs. Decree on protection of workers exposed to chemical agents (5/2020. (II.6)), Annex 3&4, as amended

Components	Value	Determinant	Specimen	Sampling Time
Cobalt (CAS 7440-48-4)	0,019 µmol/mmol	Cobalt	Creatinine in urine	*
	0,01 mg/g	Cobalt	Creatinine in urine	*
Lead (CAS 7439-92-1)	200 µg/l	lead	Blood	*
	1 µmol/l	lead	Blood	*
	80 µmol/mol hb	zinc protoporphyrin (for pre-screening)	Hemoglobin in blood	
Nickel (CAS 7440-02-0)	0,051 µmol/l	Nickel	Urine	*
	0,003 mg/l	Nickel	Urine	*

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

Luxembourg. Biological limit values (Annex II), G.D.R. of 14 November 2016, OJ Memorial A, n ° 235/2016, as amended

Components	Value	Determinant	Specimen
Lead (CAS 7439-92-1)	70 ug/ml	Pb	Blood

Portugal. Decree-Law No. 24/2012, Binding Biological Limit Values, Annex II (Diário da República - I.a série - No. 26), as amended

Components	Value	Determinant	Specimen
Lead (CAS 7439-92-1)	70 µg/100 ml	Chumbo	Blood

Slovakia. BLVs (Biological Limit Value). Regulation no. 355/2006 concerning protection of workers exposed to chemical agents, Annex 2

Components	Value	Determinant	Specimen	Sampling Time
Cobalt (CAS 7440-48-4)	20,03 µg/g	Cobalt	Creatinine in urine	*

Slovakia. BLVs (Biological Limit Value). Regulation no. 355/2006 concerning protection of workers exposed to chemical agents, Annex 2

Components	Value	Determinant	Specimen	Sampling Time
	30 µg/l	Cobalt	Urine	*
Lead (CAS 7439-92-1)	100 µg/l	Lead	Blood	*
	0,2 mg/g	Coproporphyrin	Creatinine in urine	*
	0,3 mg/l	Coproporphyrin	Urine	*

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

Spain. BELs. INSST, Límites de Exposición Profesional Para Agentes Químicos, Table 3-Valores Límite Biológicos (VLB)

Components	Value	Determinant	Specimen	Sampling Time
Lead (CAS 7439-92-1)	70 µg/dl	Plomo	Blood	*

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

Switzerland. SUVA Grenzwerte am Arbeitsplatz: Aktuelle BAT-Werte

Components	Value	Determinant	Specimen	Sampling Time
Cobalt (CAS 7440-48-4)	30 µg/l	Cobalt	Urine	*
Lead (CAS 7439-92-1)	100 µg/l	Blei (Frauen < 45 Jahre)	Blood	*
Nickel (CAS 7440-02-0)	45 µg/l	Nickel	Urine	*

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

EU. Directive 98/24/EC: on the protection of workers from the risks related to chemical agents at work, Annex II Binding Biological Limit Values and Health Surveillance Measures

Components	Value	Determinant	
Lead (CAS 7439-92-1)	70 µg pb/100		
	70 µg/100 ml	Lead	Blood

Recommended monitoring procedures

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.

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.

Derived no effect levels (DNELs)

Not available.

Predicted no effect concentrations (PNECs)

Not available.

Exposure guidelines

Austria MAK: Skin designation

Cobalt (CAS 7440-48-4)	Can be absorbed through the skin.

Belgium OELs: Skin designation

Beryllium (CAS 7440-41-7)	Can be absorbed through the skin.

Croatia ELVs: Skin designation

Beryllium (CAS 7440-41-7)	Can be absorbed through the skin.

Finland Exposure Limit Values: Skin designation

Beryllium (CAS 7440-41-7)	Can be absorbed through the skin.

Germany DFG MAK (advisory): Skin designation

Cobalt (CAS 7440-48-4)	Can be absorbed through the skin.

Hungary OELs: Skin designation

Beryllium (CAS 7440-41-7)	Can be absorbed through the skin.

Iceland OELs: Skin designation

Beryllium (CAS 7440-41-7)	Can be absorbed through the skin.

Latvia OELs: Skin designation

Beryllium (CAS 7440-41-7)	Can be absorbed through the skin.

Romania OELs: Skin designation

Beryllium (CAS 7440-41-7)	Can be absorbed through the skin.

Slovakia OELs for Carcinogens and Mutagens: Skin designation

Nickel (CAS 7440-02-0)	Can be absorbed through the skin.

Sweden Threshold Limit Values: Skin designation

Cobalt (CAS 7440-48-4)	Can be absorbed through the skin.

Switzerland SUVA Limit Values at the Workplace: Skin designation

Cobalt (CAS 7440-48-4)	Can be absorbed through the skin.

UK EH40 WEL: Skin designation

Nickel (CAS 7440-02-0)	Can be absorbed through the skin.

8.2. Exposure controls

Appropriate engineering controls

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.
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.

Individual protection measures, such as personal protective equipment

General information

Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Eye/face 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 protection

- Hand protection

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

- Other

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.

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.

Thermal hazards

Not applicable. Wear appropriate thermal protective clothing, when necessary.

Hygiene measures

Not available.

Environmental exposure controls

Environmental manager must be informed of all major releases.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid.
Form	Solid. Various shapes.
Colour	Copper.
Odour	Not applicable.
Odour threshold	Not applicable.
Melting point/freezing point	1083 °C (1981,4 °F) estimated
Boiling point or initial boiling point and boiling range	2468 °C (4474,4 °F) estimated
Flammability	None known.

Upper/lower flammability or explosive limits

Explosive limit - lower (%)	Not applicable.
Explosive limit – upper (%)	Not applicable.

Flash point	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not applicable.
pH	Not applicable.
Kinematic viscosity	Not available.
Solubility	
Solubility (water)	Not applicable.
Vapour pressure	0,79 hPa estimated
Density and/or relative density	
Density	8,82 g/cm3 estimated
Relative density	Not applicable.
Vapour density	Not applicable.
Particle characteristics	Not available.

9.2. Other information

9.2.1. Information with regard to physical hazard classes	No relevant additional information available.

9.2.2. Other safety characteristics

Evaporation rate	Not applicable.
Flammability (temperature)	Not applicable.
Specific gravity	8,82 estimated
Viscosity	Not applicable.

SECTION 10: Stability and reactivity

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

SECTION 11: Toxicological information

General information	Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation	Harmful if inhaled. May cause sensitisation by inhalation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause damage to organs (respiratory system) through prolonged or repeated exposure.
Skin contact	May cause an allergic skin reaction.
Eye contact	Not likely, due to the form of the product.
Ingestion	Not likely, due to the form of the product. Lead is absorbed into the body by ingestion
Symptoms	Difficulty in breathing. May cause an allergic skin reaction. Dermatitis. Rash. Respiratory disorder.

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity	Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Harmful if swallowed. 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 sensitisation May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin sensitisation May cause an allergic skin reaction.

Germ cell mutagenicity Due to partial or complete lack of data the classification is not possible.

Carcinogenicity Cancer hazard.

Hungary. 26/2000 EüM Ordinance on protection against and preventing risk relating to exposure to carcinogens at work (as amended)

Beryllium (CAS 7440-41-7)
Cobalt (CAS 7440-48-4)
Lead (CAS 7439-92-1)

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.

Slovenia. CMR. Protection of workers from exposure to carcinogen and mutagen agents (ULRS 101/2005, as amended)

Beryllium (CAS 7440-41-7)	Carcinogenic, Category 1B.

Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

Nickel (CAS 7440-02-0)	Carcinogenic, Category 2.

Reproductive toxicity May damage fertility or the unborn child.

Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

Lead (CAS 7439-92-1)	Toxic for reproduction, Category 1A.

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 partial or complete lack of data the classification is not possible.

Mixture versus substance information No information available.

11.2. Information on other hazards

Endocrine disrupting properties This mixture does not contain any substances having endocrine disrupting properties with respect to human health as assessed in accordance with the criteria set out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605, at a concentration equal to or greater than 0.1% by weight.

Other information Symptoms may be delayed.

SECTION 12: Ecological information

12.1. Toxicity Based on available data, the classification criteria are not met for hazardous to the aquatic environment.

Product		Species	Test Results
M-25 and M-65 Alloys			
Aquatic			
Acute			
Fish	LC50	Fish	0,0319 mg/l, 96 hours estimated

Components		Species	Test Results
Copper (CAS 7440-50-8)			
Aquatic			
Acute			
Crustacea	EC50	Blue crab (Callinectes sapidus)	0,0031 mg/l
Fish	LC50	Chinook salmon (Oncorhynchus tshawytscha)	0,02 mg/l, 96 hours

Components		Species	Test Results
Nickel (CAS 7440-02-0)			
Aquatic			
Acute			
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	0,06 mg/l, 4 days

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

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

12.3. Bioaccumulative potential No data available.

Partition coefficient n-octanol/water (log Kow) Not available.

Bioconcentration factor (BCF) Not available.

12.4. Mobility in soil No data available.

12.5. Results of PBT and vPvB assessment This mixture does not contain substances assessed to be vPvB / PBT according to Regulation (EC) No 1907/2006, Annex XIII.

12.6. Endocrine disrupting properties This mixture does not contain any substances having endocrine disrupting properties with respect to the environment as assessed in accordance with the criteria set out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605, at a concentration equal to or greater than 0.1% by weight.

12.7. Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

12.8. Additional information

Estonia Dangerous substances in soil Data

Beryllium (CAS 7440-41-7)	Beryllium (Be) 10 mg/kg Beryllium (Be) 2 mg/kg Beryllium (Be) 50 mg/kg
Cobalt (CAS 7440-48-4)	Cobalt (Co) 20 mg/kg Cobalt (Co) 300 mg/kg Cobalt (Co) 50 mg/kg
Copper (CAS 7440-50-8)	Copper (Cu) 100 mg/kg Copper (Cu) 150 mg/kg Copper (Cu) 500 mg/kg
Lead (CAS 7439-92-1)	Lead (Pb) 300 mg/kg Lead (Pb) 50 mg/kg Lead (Pb) 600 mg/kg
Nickel (CAS 7440-02-0)	Nickel (Ni) 150 mg/kg Nickel (Ni) 50 mg/kg Nickel (Ni) 500 mg/kg

SECTION 13: Disposal considerations

13.1. Waste treatment methods

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 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.

EU waste code The Waste code should be assigned in discussion between the user, the producer and the waste disposal company. Waste codes should be assigned by the user based on the application for which the product was used.

Disposal methods/information 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.

Special precautions Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. UN number Not regulated as dangerous goods.

14.2. UN proper shipping name Not regulated as dangerous goods.

14.3. Transport hazard class(es)

Class Not assigned.

Subsidiary risk -

Hazard No. (ADR) Not assigned.

Tunnel restriction code Not assigned.

14.4. Packing group -

14.5. Environmental hazards No.

14.6. Special precautions for user Not assigned.

RID

14.1. UN number Not regulated as dangerous goods.

14.2. UN proper shipping name Not regulated as dangerous goods.

14.3. Transport hazard class(es)

Class Not assigned.

Subsidiary risk -

14.4. Packing group -

14.5. Environmental hazards No.

14.6. Special precautions for user Not assigned.

ADN

14.1. UN number Not regulated as dangerous goods.

14.2. UN proper shipping name Not regulated as dangerous goods.

14.3. Transport hazard class(es)

Class Not assigned.

Subsidiary risk -

14.4. Packing group -

14.5. Environmental hazards No.

14.6. Special precautions for user Not assigned.

IATA

14.1. UN number Not regulated as dangerous goods.

14.2. UN proper shipping name Not regulated as dangerous goods.

14.3. Transport hazard class(es)

Class Not assigned.

Subsidiary risk -

14.4. Packing group -

14.5. Environmental hazards No.

14.6. Special precautions for user Not assigned.

IMDG

14.1. UN number Not regulated as dangerous goods.

14.2. UN proper shipping name Not regulated as dangerous goods.

14.3. Transport hazard class(es)

Class Not assigned.

Subsidiary risk -

14.4. Packing group -

14.5. Environmental hazards

Marine pollutant No.

EmS Not assigned.

14.6. Special precautions for user Not assigned.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Lead (CAS 7439-92-1)

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Copper (CAS 7440-50-8)
Lead (CAS 7439-92-1)
Nickel (CAS 7440-02-0)

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Lead (CAS 7439-92-1)

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use, as amended - Conditions of restriction given for the associated entry number should be considered

Beryllium (CAS 7440-41-7) 28
Cobalt (CAS 7440-48-4)
Lead (CAS 7439-92-1)

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

Cobalt (CAS 7440-48-4)
Beryllium (CAS 7440-41-7)
Lead (CAS 7439-92-1)

Regulation 2019/1148 on Marketing and Use of Explosive Precursors, Annex I, as amended

Not listed.

Regulation 2019/1148 on Marketing and Use of Explosive Precursors, Annex II, as amended

Not listed.

Other regulations

Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work. Pregnant women should not work with the product, if there is the least risk of exposure. The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended.

National regulations

Follow national regulation for work with chemical agents.
According to Directive 92/85/EEC as amended, pregnant women should not work with the product, if there is the least risk of exposure.

Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended Use of this product by young persons under the age of 18 is not allowed in accordance with the Management of Health and Safety at Work Regulations 1999 [SI 1999/3242], as amended. Follow national regulation on the protection of workers from the risks of exposure to carcinogens and mutagens at work, in accordance with Directive 2004/37/EC, as amended.

Contains a substance which is included on the TRGS 905 list of carcinogenic, germ cell mutagenic and reproductive toxic substances

Lead (CAS 7439-92-1) Blei-Metall

Contains a substance which is included on the TRGS 907 list of registry of sensitizing substances

Nickel (CAS 7440-02-0)	Nickelverbindungen, Wasserlösliche insbesondere Ni-sulfat und Ni-dichlorid

France regulations

France INRS Table of Occupational Diseases

Beryllium (CAS 7440-41-7)	Maladies professionnelles dues au béryllium et à ses composés 33
Lead (CAS 7439-92-1)	Affections dues au plomb et à ses composés 1

15.2. Chemical safety assessment Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

ADN: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.
ADR: Agreement concerning the International Carriage of Dangerous Goods by Road.
AGW: Occupational threshold limit value (Arbeitsplatzgrenzwert – Germany).
CAS: Chemical Abstract Service.
CEN: European Committee for Standardization.
IATA: International Air Transport Association.
IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.
IMDG: International Maritime Dangerous Goods.
MAC: Maximum Allowed Concentration.
MARPOL: International Convention for the Prevention of Pollution from Ships.
PBT: Persistent, bioaccumulative and toxic.
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.
STEL: Short term exposure limit.
TLV: Threshold Limit Value.
TWA: Time Weighted Average.
VLE: Exposure Limit Value.
VME: Exposure Average Value.
vPvB: Very persistent and very bioaccumulative.

References Not available.

Information on evaluation method leading to the classification of mixture The classification for health and environmental hazards is derived by a combination of calculatior methods and test data, if available.

Full text of any statements, which are not written out in full under sections 2 to 15

H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H350 May cause cancer.
H350i May cause cancer by inhalation.
H351 Suspected of causing cancer.
H360FD May damage fertility. May damage the unborn child.
H361 Suspected of damaging fertility.
H372 Causes damage to organs (respiratory system) through prolonged or repeated exposure.
H373 May cause damage to organs through prolonged or repeated exposure.

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

Training information Follow training instructions when handling this material.

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

Disclaimer

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.

To avoid any misunderstandings or incorrect assumptions by the receiver of the safety information, it should be made clear that the supplied information is not in the form of a Safety Data Sheet (SDS), but is actually a voluntary Product Information Sheet closely following the guidelines of the Safety Data Sheet – COMMISSION REGULATION (EU) No 453/2010 of 20 May 2010 (REACH/SDS).