



SAFETY DATA SHEET

MATERION

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

1.1. Product identifier

| | |
|--|-------------------------------|
| Trade name or designation of the mixture | Copper Beryllium Master Alloy |
| Registration number | - |
| Document number | A17 |
| Synonyms | Copper Beryllium Alloy |
| Issue date | 17-November-2015 |
| Version number | 09 |
| Revision date | 27-April-2021 |
| Supersedes date | 11-January-2021 |

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 fabricated metal products, except machinery and equipment 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 | Professional uses: Public domain (administration, education, entertainment, services, craftsmen) Casting, grinding or polishing of beryllium-containing alloys by artists; Casting, grinding or polishing of beryllium-containing alloys for dental crowns, appliances or prosthetics; Casting, grinding or polishing of beryllium-containing alloys for jewelry. |

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 classification applies.

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

Health hazards

| | | |
|--|---------------------------------|--|
| Acute toxicity, inhalation | Category 4 | H332 - Harmful if inhaled. |
| Skin sensitisation | Category 1 | H317 - May cause an allergic skin reaction. |
| Carcinogenicity | Category 1B | H350i - May cause cancer by inhalation. |
| Specific target organ toxicity - repeated exposure | Category 2 (Respiratory system) | H373 - May cause damage to organs (respiratory system) through prolonged or repeated exposure by inhalation. |

Hazard summary Harmful if inhaled. May cause an allergic skin reaction. May cause cancer. 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, COPPER FLAKES (COATED WITH ALIPHATIC ACID)

Hazard pictograms



Signal word Danger

Hazard statements

| | |
|------|--------------------------------------|
| H317 | May cause an allergic skin reaction. |
| H332 | Harmful if inhaled. |

H350i May cause cancer by inhalation.
H373 May cause damage to organs (respiratory system) through prolonged or repeated exposure by inhalation.

Precautionary statements

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 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

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. Restrict to professional users.

2.3. Other hazards

None known.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

General information

| Chemical name | % | CAS-No. / EC No. | REACH Registration No. | Index No. | Notes |
|---|-------------|------------------------|------------------------|--------------|-------|
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) | 95,5 - 96,5 | 7440-50-8 231-159-6 | 01-2119480154-42-0080 | - | |
| Classification: - | | | | | |
| Beryllium | 3,5 - 4,5 | 7440-41-7 231-150-7 | 01-2119487146-32-0000 | 004-001-00-7 | # |
| Classification: Acute Tox. 3;H301, Skin Irrit. 2;H315, Skin Sens. 1;H317, Eye Irrit. 2;H319, Acute Tox. 2;H330, STOT SE 3;H335, Carc. 1B;H350i, STOT RE 1;H372 | | | | | |

SECTION 4: First aid measures

General information

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.

4.1. Description of first aid measures

Inhalation

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.

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.

4.2. Most important symptoms and effects, both acute and delayed

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."

SECTION 5: Firefighting measures

General fire hazards

Not available.

5.1. Extinguishing media

Suitable extinguishing media

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

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

Not available.

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

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

For emergency responders

Not available.

6.2. 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.

6.3. Methods and material for containment and cleaning up

Clean up in accordance with all applicable regulations.

6.4. Reference to other sections

For personal protection, see section 8. For waste disposal, see section 13.

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. 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.

7.2. Conditions for safe storage, including any incompatibilities

Keep locked up. Avoid contact with acids and alkalis. Avoid contact with oxidising agents.

7.3. Specific end use(s) Not available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

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

| Components | Type | Value | Form |
|--|------|-----------------------|---------------------------|
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | MAK | 1 mg/m ³ | Inhalable fraction. |
| | | 0,1 mg/m ³ | Fume and respirable dust. |
| | STEL | 4 mg/m ³ | Inhalable fraction. |
| | | 0,4 mg/m ³ | Fume and respirable dust. |

Austria. TRK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

| Components | Type | Value | Form |
|---------------------------|------|-------------------------|---------------------|
| Beryllium (CAS 7440-41-7) | STEL | 0,008 mg/m ³ | Inhalable fraction. |
| | TWA | 0,002 mg/m ³ | Inhalable fraction. |

Belgium. Exposure Limit Values

| Components | Type | Value | Form |
|--|------|---------------------------|----------------|
| Beryllium (CAS 7440-41-7) | STEL | 0,01 mg/m ³ | |
| | TWA | 0,00005 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 1 mg/m ³ | Dust and mist. |
| | | 0,2 mg/m ³ | Fume. |

Bulgaria. OELs. Regulation No 13 on protection of workers against risks of exposure to chemical agents at work

| Components | Type | Value |
|--|------|-------------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m ³ |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 0,1 mg/m ³ |

Croatia. Dangerous Substance Exposure Limit Values in the Workplace (ELVs), Annexes 1 and 2, Narodne Novine, 13/09

| Components | Type | Value | Form |
|--|------|-------------------------|----------------|
| Beryllium (CAS 7440-41-7) | MAC | 0,002 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | MAC | 1 mg/m ³ | |
| | | 0,2 mg/m ³ | Dust and fume. |
| | STEL | 2 mg/m ³ | Dust and fume. |
| | | 2 mg/m ³ | |

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

| Components | Type | Value | Form |
|--|------|-------------------------|-------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 0,2 mg/m ³ | Fume. |

Czech Republic. OELs. Government Decree 361

| Components | Type | Value | Form |
|--|---------|-------------------------|-------|
| Beryllium (CAS 7440-41-7) | Ceiling | 0,002 mg/m ³ | |
| | TWA | 0,001 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | Ceiling | 2 mg/m ³ | Dust. |

Czech Republic. OELs. Government Decree 361

| Components | Type | Value | Form |
|------------|------|-----------------------|-------|
| | | 0,2 mg/m ³ | Fume. |
| | TWA | 1 mg/m ³ | Dust. |
| | | 0,1 mg/m ³ | Fume. |

Denmark. Exposure Limit Values Components

| Components | Type | Value | Form |
|--|------|-------------------------|-------|
| Beryllium (CAS 7440-41-7) | TLV | 0,001 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TLV | 1 mg/m ³ | Dust. |
| | | 0,1 mg/m ³ | Fume. |

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 | 0,002 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 1 mg/m ³ | Total dust. |
| | | 0,2 mg/m ³ | Fine dust. |

Finland. Workplace Exposure Limits Components

| Components | Type | Value | Form |
|--|------|--------------------------|------------------------------|
| Beryllium (CAS 7440-41-7) | STEL | 0,0004 mg/m ³ | |
| | TWA | 0,0001 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 0,1 mg/m ³ | Respirable dust and/or fume. |
| | | 0,02 mg/m ³ | Respirable. |

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 | 0,002 mg/m ³ | |
| Regulatory status: Indicative limit (VL) | | | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | VLE | 2 mg/m ³ | Dust. |
| Regulatory status: Indicative limit (VL) | | | |
| | VME | 1 mg/m ³ | Dust. |
| Regulatory status: Indicative limit (VL) | | | |
| | | 0,2 mg/m ³ | Fume. |
| 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)

| Components | Type | Value | Form |
|--|------|------------------------|----------------------|
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 0,01 mg/m ³ | Respirable fraction. |

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

| Components | Type | Value | Form |
|---------------------------|------|---------------------------|----------------------|
| Beryllium (CAS 7440-41-7) | AGW | 0,00014 mg/m ³ | Inhalable fraction. |
| | | 0,00006 mg/m ³ | Respirable fraction. |

Greece. OELs (Decree No. 90/1999, as amended) Components

| Components | Type | Value | Form |
|---------------------------|------|-------------------------|------|
| Beryllium (CAS 7440-41-7) | TWA | 0,005 mg/m ³ | |

Greece. OELs (Decree No. 90/1999, as amended)

| Components | Type | Value | Form |
|---|------|--|----------------|
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | STEL | 2 mg/m ³ | Dust. |
| | TWA | 1 mg/m ³ 0,2 mg/m ³ | Dust. Fume. |

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

| Components | Type | Value | Form |
|---|---------|--|--------|
| Beryllium (CAS 7440-41-7) | Ceiling | 0,002 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | STEL | 4 mg/m ³ | |
| | TWA | 0,4 mg/m ³ | Smoke. |
| | | 1 mg/m ³ 0,1 mg/m ³ | Smoke. |

Iceland. OELs. Regulation 154/1999 on occupational exposure limits

| Components | Type | Value | Form |
|---|------|-------------------------|------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,001 mg/m ³ | Dust. |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 1 mg/m ³ | Total dust. |
| | | 0,1 mg/m ³ | Respirable dust. |

Ireland. Occupational Exposure Limits

| Components | Type | Value | Form |
|---|------|--------------------------|----------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,0002 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 1 mg/m ³ | Dust and mist. |
| | | 0,2 mg/m ³ | Fume. |

Italy. Occupational Exposure Limits

| Components | Type | Value | Form |
|---|------|---------------------------|---------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,00005 mg/m ³ | Inhalable fraction. |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 1 mg/m ³ | Dust and mist. |
| | | 0,2 mg/m ³ | Fume. |

Latvia. OELs. Occupational exposure limit values of chemical substances in work environment

| Components | Type | Value | Form |
|---|------|-------------------------|------|
| Beryllium (CAS 7440-41-7) | TWA | 0,001 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | STEL | 1 mg/m ³ | |
| | TWA | 0,5 mg/m ³ | |

Lithuania. OELs. Limit Values for Chemical Substances, General Requirements

| Components | Type | Value | Form |
|---|------|-------------------------|----------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 1 mg/m ³ | Inhalable fraction. |
| | | 0,2 mg/m ³ | Respirable fraction. |

Netherlands. OELs (binding)

| Components | Type | Value | Form |
|--|------|-----------|---------------------|
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 0,1 mg/m3 | Inhalable fraction. |

Norway. Administrative Norms for Contaminants in the Workplace

| Components | Type | Value | Form |
|--|------|-------------|-------|
| Beryllium (CAS 7440-41-7) | TLV | 0,001 mg/m3 | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TLV | 1 mg/m3 | Dust. |
| | | 0,1 mg/m3 | Fume. |

Poland. Ordinance of the Minister of Labour and Social Policy on 6 June 2014 on the maximum permissible concentrations and intensities of harmful health factors in the work environment, Journal of Laws 2014, item 817

| Components | Type | Value | Form |
|--|------|--------------|------|
| Beryllium (CAS 7440-41-7) | TWA | 0,0002 mg/m3 | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 0,2 mg/m3 | |

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

| Components | Type | Value | Form |
|--|------|---------------|---------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,00005 mg/m3 | Inhalable fraction. |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 1 mg/m3 | Dust and mist. |
| | | 0,2 mg/m3 | Fume. |

Romania. OELs. Protection of workers from exposure to chemical agents at the workplace

| Components | Type | Value | Form |
|--|------|-------------|-------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m3 | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | STEL | 1,5 mg/m3 | Dust. |
| | | 0,2 mg/m3 | Fume. |
| | TWA | 0,5 mg/m3 | Dust. |

Slovakia. OELs for carcinogens and mutagens. Regulation No. 46/2002 on carcinogenic and mutagenic substances

| Components | Type | Value | Form |
|---------------------------|------|-------------|---------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m3 | Inhalable fraction. |

Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents

| Components | Type | Value | Form |
|--|------|-----------|---------------------|
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 1 mg/m3 | Inhalable fraction. |
| | | 0,2 mg/m3 | Respirable fume. |

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

| Components | Type | Value | Form |
|---------------------------|------|-------------|------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m3 | |

Spain. Carcinogens and Mutagens with Limit Values (Table 2)

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

Spain. Occupational Exposure Limits

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

Spain. Occupational Exposure Limits Components

| Components | Type | Value | Form |
|--|------|-----------------------|----------------------|
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 0,1 mg/m ³ | Respirable fraction. |

Sweden. OELs. Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2015:7) Components

| Components | Type | Value | Form |
|--|------|-------------------------|------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m ³ | Total dust. |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | TWA | 0,01 mg/m ³ | Respirable dust. |

Switzerland. SUVA Grenzwerte am Arbeitsplatz Components

| Components | Type | Value | Form |
|--|------|-------------------------|---------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m ³ | Inhalable fraction. |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | STEL | 0,2 mg/m ³ | Inhalable fraction. |
| | TWA | 0,1 mg/m ³ | Inhalable fraction. |

UK. EH40 Workplace Exposure Limits (WELs) Components

| Components | Type | Value | Form |
|--|------|-------------------------|----------------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,002 mg/m ³ | |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | STEL | 2 mg/m ³ | Inhalable dusts and mists. |
| | TWA | 1 mg/m ³ | Inhalable dusts and mists. |
| | | 0,2 mg/m ³ | Fume. |

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

| Components | Type | Value | Form |
|---------------------------|------|--------------------------|---------------------|
| Beryllium (CAS 7440-41-7) | TWA | 0,0002 mg/m ³ | Inhalable fraction. |

Biological limit values

No biological exposure limits noted for the ingredient(s).

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.

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.

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.

Derived no effect levels (DNELs)

Not available.

Predicted no effect concentrations (PNECs)

Not available.

8.2. Exposure controls

Appropriate engineering controls

Follow standard monitoring procedures.

Individual protection measures, such as personal protective equipment

General information

Not available.

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.

Hygiene measures Handle in accordance with good industrial hygiene and safety practices.

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

Appearance

Physical state Solid.

Form Various shapes.

Colour Copper.

Odour Not applicable.

Odour threshold Not applicable.

pH Not applicable.

Melting point/freezing point 871,11 - 1071,11 °C (1600 - 1960 °F) / Not applicable.

Initial boiling point and boiling range Not applicable.

Flash point Not applicable.

Evaporation rate Not applicable.

Flammability (solid, gas) 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.

Vapour pressure 0,00001 hPa estimated

Vapour density Not applicable.

Relative density Not applicable.

Solubility(ies)

Solubility (water) Not applicable.

Solubility (other) Not applicable.

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

Auto-ignition temperature Not applicable.

Decomposition temperature Not applicable.

Viscosity Not applicable.

Explosive properties Not applicable.

Oxidising properties Not applicable.

9.2. Other information

Density 8,62 g/cm³ estimated

Flammability Not applicable.

Specific gravity 8,62 estimated

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 | Avoid dust formation. Contact with acids. Contact with alkalis. |
| 10.5. Incompatible materials | Strong acids, alkalies and oxidizing agents. |
| 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 | May cause damage to organs (respiratory system) through prolonged or repeated exposure |
| Skin contact | Not likely, due to the form of the product. |
| Eye contact | Not likely, due to the form of the product. |
| Ingestion | Not likely, due to the form of the product. |

Symptoms Respiratory disorder.

11.1. Information on toxicological effects

| | |
|--|--|
| Acute toxicity | Based on available data, the classification criteria are not met. |
| Skin corrosion/irritation | Not likely, due to the form of the product. |
| Serious eye damage/eye irritation | Not likely, due to the form of the product. |
| Respiratory sensitisation | May cause damage to organs (respiratory system) through prolonged or repeated exposure |
| Skin sensitisation | Not a skin sensitiser. |
| Germ cell mutagenicity | Due to 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)

IARC Monographs. Overall Evaluation of Carcinogenicity

Beryllium (CAS 7440-41-7) 1 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.

| | |
|---|---|
| Reproductive toxicity | Not classified. |
| Specific target organ toxicity - single exposure | Not classified. |
| 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. |
| Mixture versus substance information | Not available. |
| Other information | Symptoms may be delayed. |

SECTION 12: Ecological information

12.1. Toxicity

| Product | Species | Test Results |
|-------------------------------|-----------|---------------------------------|
| Copper Beryllium Master Alloy | | |
| Aquatic | | |
| <i>Acute</i> | | |
| Fish | LC50 Fish | 0,0191 mg/l, 96 hours estimated |

| Components | Species | Test Results |
|--|--|--|
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | | |
| Aquatic | | |
| <i>Acute</i> | | |
| Fish | LC50 | Fathead minnow (<i>Pimephales promelas</i>) 0,0184 - 0,042 mg/l, 96 hours |
| * 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 | Not available. | |
| Partition coefficient n-octanol/water (log Kow) | Not available. | |
| Bioconcentration factor (BCF) | Not available. | |
| 12.4. Mobility in soil | Not available. | |
| 12.5. Results of PBT and vPvB assessment | Not a PBT or vPvB substance or mixture. | |
| 12.6. Other adverse effects | Not available. | |
| 12.7. 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 |
| COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8) | | Copper (Cu) 100 mg/kg Copper (Cu) 150 mg/kg Copper (Cu) 500 mg/kg |

SECTION 13: Disposal considerations

13.1. Waste treatment methods

| | |
|-------------------------------------|---|
| 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. |
| 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. |

SECTION 14: Transport information

ADR

14.1. - 14.6.: Not regulated as dangerous goods.

RID

14.1. - 14.6.: Not regulated as dangerous goods.

ADN

14.1. - 14.6.: Not regulated as dangerous goods.

IATA

14.1. - 14.6.: Not regulated as dangerous goods.

IMDG

14.1. - 14.6.: Not regulated as dangerous goods.

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

Not listed.

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 FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8)

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

Not listed.

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

Beryllium (CAS 7440-41-7)

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

Beryllium (CAS 7440-41-7)

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Beryllium (CAS 7440-41-7)

COPPER FLAKES (COATED WITH ALIPHATIC ACID) (CAS 7440-50-8)

Other regulations

The product is classified and labelled in accordance with EC directives or respective national laws. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. 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.

National 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.

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations Not available.

References Not available.

Information on evaluation method leading to the classification of mixture Not available.

Training information 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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