

COPPER BERYLLIUM FOUNDRY SAFETY PRACTICES

SF12 - Version 3, March, 2018

Copper beryllium (CuBe), in solid form and as contained in finished products, presents no special health risks. Most manufacturing operations, conducted properly on well-maintained equipment, are capable of safely processing copper beryllium-containing materials. However, like many industrial materials, copper beryllium may present a health risk if handled improperly. The inhalation of dust, mist or fume containing beryllium can cause a serious lung condition in some individuals. The degree of hazard varies, depending on the form of the product, how it is processed and handled, as well as the amount of beryllium in the product. Read the product specific Safety Data Sheet (SDS) for additional environmental, health and safety information before working with copper beryllium alloys.

In addition, processing copper beryllium alloys shall be conducted in accordance with the Beryllium Standard for General Industry (29 CFR 1910.1024) established by the Occupational Safety and Health Administration (OSHA) which includes a Permissible Exposure Limits (PEL) of 0.2 microgram beryllium per cubic meter ($0.2 \mu\text{g}/\text{m}^3$) as an 8-hour Time Weighted Average (TWA), a Short-Term Exposure Limit (STEL) of $2.0 \mu\text{g}/\text{m}^3$ determined over a 15-minute sampling period and ancillary requirements prompted at an Action Level (AL) of $0.1 \mu\text{g}/\text{m}^3$ or other specified situations.

General foundry safety practices employed for melting other metals are applicable to copper beryllium. Furnace ventilation is required to prevent the dispersal of fume and gross particles from the surface of the melt during mixing, skimming, sampling, pouring and furnace maintenance.

Contact of the molten copper beryllium with air will lead to preferential oxidation of the beryllium. The dross formed by this reaction will concentrate beryllium oxide (BeO), which floats to the surface of the melt as small particles. If the beryllium oxide film is continuous and undisturbed, it provides some protection to the melt from further oxidation. Sufficient agitation of the melt surface can cause the dross particles to become airborne where they can present a hazard.

Operations that produce particulate must be controlled to prevent worker exposure to the dust. Where adequate ventilation is not possible, appropriate worker respiratory protection must be provided.

Ventilation above the furnace during mixing, dross removal and pouring operations provides worker protection from airborne particulate. A collar duct, which draws particulate away from the operator's breathing zone, allows access to the melt surface while providing the necessary ventilation. Similarly, the dross collection container should also be ventilated when in use to prevent air contamination. To be effective, the ventilation system must be designed for your particular furnace configuration and must have a regular maintenance program by a knowledgeable person. Disposal of contaminated refractory must be done in a manner that limits air dispersal and is compliance with the OSHA Beryllium Standard.

Copper beryllium castings present no hazards unless subjected to cleaning and machining operations that generate particulate. If the castings are grit blasted, sanded, ground, polished or abrasively sawed, the operation should be ventilated to capture particulate. Performing the operation wet reduces the potential to generate airborne beryllium-containing particulate. Castings that become scaled during heat treatment should be machined and handled in a manner that prevents excessive spalling of the surface oxide.

Copper beryllium scrap is not hazardous under federal regulations. Its disposal procedure is the same as other common metals such as brass, steel or aluminum. Lubricant or oil removal may be required before disposal. However, if properly segregated from other metals, your copper beryllium scrap can be valuable. Materion Brush Inc. purchases clean scrap (routine amounts of lubricant are not a problem) for recycling.



ADDITIONAL INFORMATION

The information contained in this Safety Facts applies only to the subject referenced in the title. Read the SDS specific to the products in use at your facility for more detailed environmental, health and safety guidance. SDSs can be obtained by contacting the Materion Brush Inc. Product Safety Hotline at (800) 862-4118 or visit our website at www.materion.com.

Additional information can also be obtained by contacting a Materion Brush Inc. Sales Representative or:

Product Stewardship Department
Materion Brush Inc.
6070 Parkland Boulevard
Mayfield Heights, Ohio 44124
(800) 862-4118