

SAFETY PRACTICES FOR HEAT TREATING COPPER BERYLLIUM PARTS

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CuBe

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.

Heat treating of copper beryllium parts presents minimal environmental hazards. However, as with all heat treating operations, certain safety precautions are required. Before heat treating, the parts should be cleaned to remove the stamping or machining lubricant, which, if not removed, can cause staining when exposed to elevated temperatures. While copper beryllium heat treating operations do not generate any beryllium-containing fume, spalling of the surface oxide during subsequent machining or handling steps can cause potential exposure.

High temperature annealing operations in air produce a thick oxide that is easily dislodged from the surface. Although the scale is composed mostly of copper oxides, it contains beryllium oxide in proportion to the beryllium content of the alloy. It is best if the furnace atmosphere is controlled to minimize oxide formation. An inert or reducing furnace atmosphere in the lower temperature precipitation aging step produces a thin, adherent oxide that usually presents no handling problems.

The oxidized surface of heat-treated copper beryllium parts should be cleaned before further processing, particularly if they will be plated, soldered, brazed or welded. Chemical cleaning in an acid solution is preferred to minimize the potential for exposure to fine particulate. Mechanical surface conditioning, such as grinding or grit blasting, must be done in a safe manner to prevent generation of airborne particulate. Keeping the oxide moist will control generation of airborne particulate during handling and disposal; however, ventilation is the preferred method to control airborne generation of particulate.



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:

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