

Process Specific Control Summary

Precision Stamping of Copper Beryllium Alloys

Purpose

This document has been developed to communicate the results of case studies performed on specific operations where copper beryllium (CuBe) alloys are processed and to provide the reader with information on exposure and exposure control options such as work practice, administrative and engineering controls.

Introduction

An airborne beryllium exposure assessment was conducted during Precision Stamping of CuBe Alloy. The intent of the study was to characterize worker exposure to airborne beryllium and identify work practice controls necessary to maintain exposures to consistently below the beryllium industry's Recommended Exposure Guideline (REG).

Precision Stamping

Precision Stamping is the process by which thin strips of metal (CuBe Alloy) are rapidly shaped and cut to precise tolerances using high-speed punch presses. In this study the punch presses operated between 170 and 1000 cycles per minute. These presses were capable of producing as many as 60,000 parts per hour.

Read the SDS specific to the products in use at your facility for detailed information on the health effects of exposure to beryllium.

Airborne Exposure Standards

BeST utilizes a Recommended Exposure Guideline (REG) of $0.6 \mu\text{g}/\text{m}^3$ (inhalable sampling method) and $0.2 \mu\text{g}/\text{m}^3$ (total-closed face filter cassette/CFC Total sampling method) which has proven effective when used in concert with the remaining elements of the Beryllium Worker Protection Model.



Baseline Exposure Evaluation

Forty-five (45) full shift exposure samples, using the CFC Total method, were collected in the breathing zone of operators performing Precision Stamping of CuBe Alloy.

Personal Sample Results (CFC Total Method)

Number of Samples	Range $\mu\text{g}/\text{m}^3$	Percent Exceedance ¹ at $0.2 \mu\text{g}/\text{m}^3$	UTL _(95/95) ² $\mu\text{g}/\text{m}^3$
45	<0.0046 - 0.017	<0.000	0.01

¹Percentage of exposures expected to exceed $0.2 \mu\text{g}/\text{m}^3$ (comparable to $0.6 \mu\text{g}/\text{m}^3$ Inhalable). A percent exceedance of < 5% is considered to be "Well Controlled".
²Upper Tolerance Limit – one can be ninety-five-percent confidence that fewer than 5% of measurements are above the UTL(95/95)

Exposure Controls in Use during Baseline Characterization

Stamping metal parts is a noisy process, to control noise exposure some of the presses were enclosed and equipped with local exhaust ventilation. However, many of the presses, in this study, did not have local exhaust ventilation and were located in areas with only general ventilation.

Exposure Characterization Summary - Evaluation Interpretations

- The operator's personal exposure results were reliably below the REG for airborne beryllium.
- General ventilation is adequate to maintain exposures to reliably below the REG for airborne beryllium.

Recommendations

- Implement the remaining elements of the Beryllium Worker Protection Model. Please review the Be Responsible Program at www.berylliumssafety.eu.



SUMMARY

Operations

Good work practices such as avoiding activities that result in airborne dust creation (dry cleaning or use of compressed air to remove particulate) and implementation of procedures for keeping the milling center and floors clean and free of CuBe scrap accumulations are important methods for maintaining exposures reliably below the REG.

Maintenance

Under certain conditions, the repair or maintenance of equipment can generate airborne particles. Protecting workers can require the use of specific work practices or procedures involving the combined use of ventilation, wet and vacuum cleaning methods, respiratory protection, decontamination, special protective clothing and when necessary, restricted work zones. Detailed procedures for safely maintaining the process equipment and ventilation systems should be developed. All operators and maintenance personnel need to be trained in the established procedures prior to performing maintenance or service activities.

ADDITIONAL INFORMATION

The information contained in this document 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.

The Be Responsible Program can be viewed at www.berylliumssafety.eu.

The foregoing is provided solely for informational purposes, based upon data believed to be correct and up to date, and is not to be construed as a warranty, express or implied, of any kind. The information above may not apply to a user's manufacturing operations; it is the responsibility of the user to determine safe conditions for the use of beryllium-containing products in its own operations and to comply with all applicable health and safety laws. Users should not rely solely on this information to make decisions about exposure control, but should consult with experts who can evaluate the users' operations and make specific recommendations tailored to those operations.

Additional information may also be available by contacting:

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