MATERION

FREQUENTLY ASKED QUESTIONS

Frequently Asked Questions about Airborne Beryllium Levels and Exposure Assessment
FAQ 102

What are the current occupational exposure levels in major industrialized nations?

The 8-hour time weighted average (TWA) occupational exposure level (OEL) for beryllium ranges from 0.05 micrograms per cubic meter of air (µg/m^3) to 5 µg/m^3 with the majority of industrialized nations using an OEL of 2.0 µg/m^3.

Are changes to the occupational exposure limit expected in the next several years?

Yes. Several countries, including the European Union and the United States, have been in the process of evaluating their OEL for beryllium. In fact, the United States Occupational Safety and Health Administration (OSHA) issued a new Beryllium Standard for General Industry (29 CFR 1910.1024) in January 2017 which includes a Permissible Exposure Limits (PEL) of 0.2 micrograms per cubic meter (0.2 µg/m^3) as an 8-hour Time Weighted Average (TWA) and 2.0 µg/m^3 as a Short-Term Exposure Limit (STEL) determined over a 15-minute sampling period. The standard also includes ancillary requirements prompted at an Action Level (AL) of 0.1 µg/m^3 or other specified situations. Materion Brush Inc. expects little impact to the copper beryllium stamping industry, but does expect moderate-to-significant impact to Bulk Products customers with operations that produce dust, mist or fume (see Safety Facts 105 - Processing Copper Beryllium Alloys).

Does Materion Brush Inc. have an occupational exposure guideline for airborne beryllium?

Yes. Materion Brush Inc. has adopted a recommended exposure guideline (REG) of 0.2 µg/m^3 TWA based on recent studies[1,2,3] and consideration of particle size[4,5], chemical form[6] and process related risks[7]. Materion Brush Inc. utilizes work practices that reduce airborne dust generation, engineering controls and respiratory protection in its efforts to maintain worker exposures below 0.2 µg/m^3.

How can I determine employee airborne beryllium exposure?

Materion Brush Inc. recommends using qualified occupational health professionals to collect representative air samples and statistically analyze[8] the results to give a reliable determination of employee airborne beryllium exposure.

Where can I find an occupational health professional?

Materion Brush Inc. has provided training to independent industrial hygiene consultants across the U.S. in beryllium hazard recognition and control of beryllium manufacturing operations. Today, most of these consultants are part of the Beryllium Consultant Network (BCN). To obtain a list of the BCN and find the consultant(s) nearest you, access our web site at materion.com. Resources are also available in the phone book or search engines on the web under “Industrial Hygiene Consultants,” occupational health professional association websites in the U.S. (American Industrial Hygiene Association) and European Union (British Occupational Hygiene Society). In some countries and some states, occupational health services are available (sometimes without cost) from government organizations related to health and safety, workers’ compensation,

or public health protection. For example, in the United States, OSHA offers a free consultant service to industry. In addition, workers' compensation insurers often provide such services, sometimes without cost or at lower cost.

What should I do if the air sample results indicate a possible problem?

1. Consider whether immediate actions are necessary to protect personnel from exposure.
2. Contact an occupational health professional for consultation. This professional will be able to assist you in determining your need for the following:

- Work practice analysis
- Respiratory protection
- Training
- Clothing and skin protection
- Migration control
- Exposure assessment
- Engineering controls
- Housekeeping procedures

Materion Brush Inc. uses a comprehensive program, including worker training, engineering and work practices, to control fugitive dust emissions and work area cleanliness. Materion Brush Inc. believes it is also important to keep particulate containing beryllium out of the lungs, off the skin, off of clothing, in the work process, in the work area and on the plant site to reduce risk of adverse health effects.

How can I obtain assistance?

If you have any questions regarding the above information, please contact your sales representative; our sales department at +1-216-486-4200; or the Product Safety Hotline at 1-800-862-4118 (in the U.S.) or +1-216-383-4019 (outside the U.S.). This document, as well as other product specific safety data information, can be found at www.materion.com. Additionally, information on the Beryllium Worker Protection Model and process specific safety guidance can be found in the Interactive Guide to Working Safely with Beryllium and Beryllium-containing Materials at www.berylliumsafety.com.

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[1]Johnson J., et al. Beryllium Exposure Control Program at the Cardiff Atomic Weapons Establishment in the United Kingdom. Appl Occup Environ Hyg 16(5): 619-630 (2001).
[2]Schuler, C., et al. Process-Related Risk of Beryllium Sensitization and Disease in a Copper-Beryllium Alloy Facility. Am J Ind Med 47:195–205 (2005).
[3] Madl A.K., et al. Exposure-Reponse Analysis for Beryllium Sensitization and Chronic Beryllium Disease Among Workers in a Beryllium Metal Machining Plant. JOEH 4:6 448-466 (2007)
[4]Kent M., Robins T., Madl A. Is Total Mass or Mass of Alveolar-Deposited Airborne Particles of Beryllium a Better Predictor of the Prevalence of Disease? A Preliminary Study of a Beryllium Processing Facility. Appl Occup Environ Hyg 16(5): 539-558 (2001).
[5]McCawley M. et al. Ultrafine Beryllium Number Concentration as a Possible Metric for Chronic Beryllium Disease Risk. Appl Occup Environ Hyg 16(5): 631-638 (2001).
[6]Deubner D., et al. Beryllium Sensitization, Chronic Beryllium Disease, and Exposures at a Beryllium Mining and Extraction Facility. Appl Occup Environ Hyg 16(5): 579-592 (2001).
[7]Kreiss K., Mroz M., Zhen B., Wiedemann H., Barna B. Risks of beryllium disease related to work processes at a metal, alloy, and oxide production plant. Occ. and Env. Medicine 54: 605-612 (1997).
[8]American Industrial Hygiene Association "A Strategy for Assessing and Managing Occupational Exposures, 3rd Ed.".