

STANFORD UNIVERSITY

STANFORD LINEAR ACCELERATOR CENTER

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Jan 15, 1998

Mr. John Muhlestein
DOE Stanford Site Office/Bin 08A
Stanford Linear Accelerator Center
P.O. Box 4349
Stanford, CA 94309

Subject: SLAC Chronic Beryllium Disease Prevention Program

Dear Mr. Muhlestein:

The attached SLAC Chronic Beryllium Disease Prevention Program is forwarded in response to your request for a program to control this hazard. The CBDPP requirements are included in the existing industrial hygiene chapter of the SLAC ES&H manual, and will be supplemented by a new section 8 for this document which provides specific instructions for Beryllium. If you have any questions please give me a call at (650) 926-3295.

Sincerely,

Jack Hahn
Department Head
Safety, Health & Assurance Department
Environment, Safety & Health Division

JH:cn
Enclosure

cc: K. Kase
J. Shepardson

8 SLAC Chronic Beryllium Disease Prevention Program (CBDPP)

Beryllium containing materials are cut and cleaned at SLAC in small scale, occasional operations. Within the DOE, it has recently become apparent that some contractor employees who have worked (or are currently working) with Beryllium have developed chronic Beryllium disease (CBD), an occupational granulomatous lung disorder. Respiratory exposure to aerosolized Beryllium, in susceptible individuals, causes an immunological reaction that can result in granulomatous scarring of the lung, shortness of breath, cough, fatigue, weight loss, and, ultimately, respiratory failure. Beryllium is classified as a suspected human lung carcinogen by the National Toxicity Program (U.S. Department of Health and Public Services), and the International Agency for Research on Cancer (World Health Organization). SLAC has monitored industrial processes for airborne Beryllium since the 1970's, and has records of medical preplacement exams since 1965. All metalworking procedures for Beryllium containing materials outlined in this chapter are based on this sampling history which demonstrates minimal airborne exposure during these processes.

Purpose of the SLAC Chronic Beryllium Disease Prevention Program

- Minimize the use of Beryllium containing materials by substitution of other materials.
- Provide guidance for minimizing potential worker exposure to Beryllium during any handling or use.
- Outline medical monitoring and surveillance of workers exposed (or potentially exposed) to Beryllium, based on the best current understanding of Beryllium disease and medical diagnostic tests available.
- To provide job specific safety procedures for any use of Beryllium that could generate dusts, mists, fumes, or small particulates.

Beryllium has been used at SLAC ;

- In the form of (2% Beryllium) Copper alloy to shield beam line electrical contacts from stray radiofrequency components. Beryllium Copper sheet material has been sheared, punched, and cut by electrodischarge machine (EDM).
- as Beryllium oxide ceramics in klystron windows due to thermal conductive properties.
- in pure form as short sections of beam pipe (not machined or manufactured at SLAC).
- in tools which have a small percentage of Beryllium to harden non-ferromagnetic metals in tools (not machined or manufactured at SLAC).

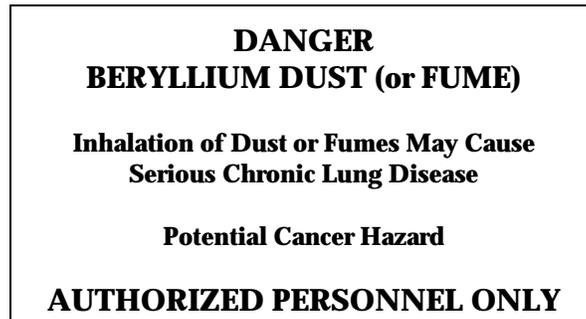
Procedures for Safe Handling of Beryllium

Operation	Location	Required Procedures (defined below)
Acid dip cleaning of Beryllium Copper Parts	Electroplating Shop Building 25	Warning sign, glove and eye protection, detailed air sampling, wash hands
Electrodischarge cutting of Beryllium Copper Sheet	Machine Shop Building 25	Warning sign, glove and eye protection, detailed air sampling., wash hands, Proper Cleanup, Disposal of Scrap materials
Punching, Shearing, Soldering of Beryllium Copper Parts	Machine Shops Buildings 25 and 40	Warning sign, glove and eye protection, detailed air sampling., wash hands, Proper Cleanup, Disposal of Scrap materials
Handling of Tools, Beamline Components, or other end use materials containing Beryllium	Throughout SLAC	Glove protection required when handling items

Any other work on Beryllium containing materials require an industrial hygiene survey. Contact the Safety Health and Assurance (SHA) Department in ES&H for assistance.

8.1 Required Procedures - Definitions

Warning Sign - The work areas where Beryllium is cut using an EDM machine, or metal shear or punch must be posted with the following sign;



Wash Hands - Sinks must be available to personnel in or near the workplace. Workers must wash hands before eating, drinking or leaving the workplace.

Proper Cleanup - Any shear or cutting device that has potential dust created by these operations should be wiped clean and the wipes should be disposed of as hazardous waste.

Detailed Air Sampling - This means conducting a large number of air samples to evaluate personal exposure levels with high accuracy. Since SLAC currently conducts shearing, or EDM cutting once every 6 months, this will mean that 100% of these operations will be air sampled by a SLAC industrial hygienist.

8.2 Baseline Inventory of Operations involving Beryllium

SLAC is required to inventory all Beryllium containing materials which are to be machined, cut, or polished. This inventory will be maintained by the industrial hygiene department in ES&H. This inventory will not include any Beryllium containing material which is manufactured off site and has end use functions at SLAC which do not release airborne beryllium such as a Copper-Beryllium wrench, beamline component, or klystron window.

The Beryllium inventory is required to be maintained in a computerized format, and will consist of the following data.

1. Department
2. Location, Building number, and room

3. Point of Contact

4. Quantity of material in size or weight.

5. Contents of material, i.e.. Pure Beryllium, or 2% Beryllium/98% Copper.

6. Intended machining use, i.e.. Cutting, Shearing, EDM Cutting.

8.3 Performance Goals

The SLAC ES&H performance goals for airborne Beryllium exposures will be to maintain worker exposure below detectable levels and to maintain the current low rate of work with Beryllium materials. Operations which produce detectable airborne Beryllium levels will be controlled, contracted out, or discontinued. At present, there are no operations at SLAC which produce detectable levels of Beryllium.

8.4 Project Planning

Any new operation, or other metalworking on Beryllium containing materials can not be performed at SLAC without the written approval of the ES&H Safety Health and Assurance industrial hygienist.

8.5 Medical Surveillance for Beryllium

The SLAC ES&H industrial hygiene and medical departments have reviewed more than 20 historical air sampling surveys and other records of Beryllium use at SLAC, and have interviewed numerous SLAC employees concerning historical use of Beryllium containing materials. Based on these records medical surveillance will be offered to personnel who are considered to be most at risk. Any employee of SLAC who has worked with Beryllium should contact the ES&H industrial hygiene department to determine if medical surveillance for Beryllium is appropriate.

8.6 Beryllium Training

All personnel who conduct machining of Beryllium parts and their supervisors must be informed of the potential health hazards associated with occupational exposure to Beryllium.

The OSHA Hazard Communication Standard (29 CFR 1910.1200) requires employers to provide all employees information on the physical and health hazards of chemicals, and safe handling precautions. It also requires employers to establish a Hazard Communication Program that includes guidance for labeling containers, completing MSDS's, and developing training programs.

Contact John Shepardson (x4105) of the ES&H Safety and Health Department for information on Beryllium safety training.