

Beryllium Policy and Procedures

Revised 05/05/2021



To create a safe working environment by establishing and following recommended work practices and guidelines. Beryllium metal and its alloys are used in a wide variety of industrial products because they are light, resistant to heat, stress and strain. All procedures that may present a health hazard should be reviewed and approved by the Industrial Hygiene Program (IHP).

Health Effects

The inhalation of dust, fumes or mists containing beryllium or beryllium compounds present a very serious health hazard. Laboratory processes that can produce fumes or finely divided dust that may present a health hazard include heating, surface grinding or machining of beryllium and its alloys.

Chronic beryllium disease (CBD) and pulmonary berylliosis are detected through x-ray changes, granulomas and a decrease in the ability of the lungs to transport oxygen. Acute beryllium disease is a result of the inhalation of soluble beryllium compounds. It causes inflammation of the mucous membranes of the respiratory tract and irritation of the lungs.

Contact dermatitis is caused primarily by the soluble salts of beryllium particularly the fluoride but the metal and beryllium oxides have also been suspected.

Medical Surveillance

All employees working with beryllium in a manner that creates potential worker exposure can receive a preplacement physical exam to establish a baseline to compare future physicals and x-rays. After initial evaluation by the occupational physician, an employee who is eligible for the Surveillance Program will be recalled via letter 12 months after last exam by the physician. To enroll into the Beryllium Workers Surveillance Program any student, researcher, employee or their supervisor can contact the EHS at (617) 452-3477. In addition, IHP may recommend researchers or workers to enroll if they note potential beryllium exposure in any workplace evaluation. The program is voluntary and free.

Controls

Recommended work practices should minimize worker exposure to beryllium dust or fumes. Therefore, all beryllium work should be done in designated areas approved by the Industrial Hygiene Program. Standard operating procedures and guidelines for specific operations should be established and approved before working with beryllium and its compounds. Prior to working with beryllium employees must receive training and annually thereafter. The training should include but not limited to the health hazards of the material, personal protective equipment and the proper handling and disposal procedures. The control and capture of beryllium particles should be done at the source with local exhaust ventilation or glove box. Negative exhaust systems shall be equipped

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with HEPA filtration. Contact the Industrial Hygiene Program (617) 452-3477 for design criteria.

Respiratory Protection

Respiratory protection should not be used as a substitute for engineering controls but may be used in emergency situations or when potential exposure may occur. Respirator users must be enrolled in the MIT Respiratory Protection Program, refer to the policy document on Respiratory Protection. The Industrial Hygiene Program will assist in the selection of the appropriate respiratory protection.

Personal Protective Equipment

Clothing - To avoid carrying any contamination from the work area, protective clothing or work clothing should be worn when exposure to beryllium dust or powders may occur. A change room may need to be provided to remove contaminated clothing. All beryllium-contaminated items should be cleaned or disposed of properly.

Eye Protection - Always wear eye protection when in the laboratory or when a risk of eye injury is present i.e. grinding, machining etc.

Gloves - Neoprene, rubber or nitrile gloves should be worn to help provide protection from allergic dermal reactions from water-soluble beryllium compounds. Durable protective gloves of leather should be worn to prevent cuts and abrasions during the handling of beryllium metal, which may cause irritation.

Air and Wipe Sampling

Sampling will be conducted by the Industrial Hygiene Program to determine personal exposure and surface contamination from beryllium. Personal monitoring will be conducted when a new operation is begun. The ACGIH TLV for beryllium is 0.05 ug/m³. The OSHA PEL 0.2 ug/m³. Once exposure levels have been documented below the PEL no further testing is required but will be done if operations change. Area sampling will be conducted to determine contamination in surrounding areas. Wipe sampling will be conducted to determine the extent of surface contamination. Surfaces found to be greater than 25ug/ft² shall be considered contaminated and will need to be cleaned and retested.

All process areas shall have warning signs near areas where exposure to beryllium dust may occur. All storage items used for beryllium will have a precautionary label applied. The label should have the name of the compound and associated hazards.

- **DANGER: Beryllium Exposure Area**
- **BERYLLIUM CONTAINING: Name of Compound**
- **DANGER: Harmful if Inhaled**
Possible Beryllium Contamination

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Housekeeping

Housekeeping practices should be performed regularly and thoroughly to prevent the accumulation of beryllium-containing dust on surfaces and to limit the spread of contamination. Housekeeping can result in worker exposures to beryllium-contaminated dust. Therefore, PPE should always be worn, and procedures should focus on preventing the spread and re-entrainment of dust during housekeeping activities. Acceptable methods include wet cleaning, HEPA vacuuming or the use of “sticky tack cloths”. Dry cleaning methods and the use of compressed air are prohibited for cleaning beryllium-contaminated floors and surfaces.

Disposal

Beryllium waste must be packaged and handled to prevent dust from becoming airborne. Disposal of beryllium waste and contaminated items will be handled through the Environmental Management Program (EMP) at (617) 452-3477. Specific questions concerning the packaging and storage of beryllium waste should be directed to the Safety Program.

If you have questions, please contact the EHS Office 617-452-4377 or environment@mit.edu