

Potential Health Effects from Exposure to Water Soluble Beryllium Compounds

SF400 - Version 3, March, 2018

Water Soluble Be Compounds

These materials present a health risk if handled improperly. 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. In severe cases, exposure by any route may lead to a very serious chemical pneumonia that can be fatal. The inhalation of dust, mist or fume containing soluble beryllium compounds can also cause a serious short-term and long-term lung condition in some individuals. An additional health risk associated with soluble beryllium compounds is the inhalation of small dust, mist and fume having diameters less than 10 microns or 0.0005 inch, at which size they are invisible to the naked eye. Many processes do not generate particles this small and those that do must be controlled by using appropriate engineering and work practice controls. You must read the product specific Safety Data Sheet (SDS) for additional environmental, health and safety information before working with any beryllium-containing material.

In addition, processing beryllium compounds 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.

ROUTES OF ENTRY

Beryllium compounds can enter the body in three ways; eye or skin contact, ingestion or swallowing, and of most concern, by inhalation or breathing.



EYE CONTACT - Severe injury to the eyes can result from contact with water soluble beryllium compounds. Exposure may result to the eyes from direct contact with particulate or contact with contaminated hands or clothing. As with all chemical processing operations, use proper protection such as safety glasses with side shields, goggles or face shields. Material should be flushed from the eyes with large quantities of clean water. Obtain medical help if irritation persists.



SKIN CONTACT - Water soluble beryllium compounds pose a potential for contact dermatitis of both the irritation and allergic type. Cuts or lacerations must be thoroughly washed to remove all particulate debris from the wound. Accidental implantation of soluble beryllium compounds beneath the skin has the potential to induce sensitization and skin lesions. Impermeable gloves and clothing must be worn to prevent skin contact with water soluble beryllium compounds. Skin contamination can be removed by washing with soap and water. Obtain medical help if irritation persists.

EXAMPLES OF BERYLLIUM COMPOUNDS KNOWN TO CAUSE SPECIAL EYE & SKIN REACTIONS	BERYLLIUM MATERIALS NOT KNOWN TO CAUSE SPECIAL EYE & SKIN REACTIONS
Water Soluble Beryllium Salts	Metallic Beryllium
Beryllium Chloride	Copper Beryllium
Beryllium Sulfate	Beryllium Oxide (Beryllia)
Beryllium Fluoride	Nickel Beryllium
Beryllium Nitrate	Aluminum Beryllium



INGESTION - Ingestion may result in severe nausea, diarrhea, vomiting and abdominal pain.

Beryllium compounds, as with most industrial materials, are not intended for internal human consumption. Ingestion can occur when materials contact hands, clothing, food and drinks which is followed by eating, drinking, smoking, nail biting, etc.

Always practice good personal hygiene by not eating, drinking or smoking in manufacturing areas, and wash hands before doing so in designated areas.



INHALATION

ACUTE (SHORT TERM) HEALTH EFFECTS - Exposure to certain types of water soluble beryllium salts may cause severe, acute (immediate short-term) health effects. The health effects of acute beryllium lung disease are very similar to pneumonia or bronchitis. Seek medical attention immediately because in severe cases, acute beryllium disease can be fatal. Recovery is generally complete after a period of several weeks or even months. Persons who have had acute disease may also develop chronic beryllium disease over time. Cases of this acute lung condition have rarely occurred since the 1960's due to the implementation of current industrial hygiene standards and controls.

CHRONIC (LONG TERM) HEALTH EFFECTS - People who are sensitive to inhaled beryllium particles can develop a serious and sometimes fatal lung disease called chronic beryllium disease ("CBD"). Chronic (*Long Term*) health effects may take months or years to develop. CBD is a condition in which the tissues of the lungs become inflamed, restricting the exchange of oxygen between the lungs and the blood stream. CBD does not occur in most people. However, it is not currently possible to tell who is potentially allergic and who is not. Therefore, all workers need to be protected and airborne beryllium particles must be controlled by implementing engineering controls and good work practices. Three factors are required, and all must be present for a person to develop CBD. First, the individual must be exposed to airborne beryllium in the form of a dust, mist or fume. Second, the particles must be tiny enough to reach the air sacs deep in the lungs; and third, the person must be sensitive or allergic to beryllium.

Small, respirable beryllium particles depositing on hands, gloves and clothing, could be transferred to the breathing zone and inhaled during normal hand to face motions. Care should be taken not to touch the face with contaminated hands or clothing. Wear proper personal protective equipment to prevent skin and clothing contact with beryllium particles. Wash hands if they become contaminated.

CANCER - Although beryllium has produced tumors in some laboratory animals, and is listed or suspected as a human carcinogen by some agencies, Materion Brush Inc. believes there is no credible evidence that beryllium causes cancer in humans. In fact, the American Conference of Governmental Industrial Hygienists recently stated their belief that the risk of cancer is low in modern beryllium manufacturing plants. However, because cancer research is continuing, Materion Brush Inc. recommends that caution be maintained since beryllium, like other commonly used metals, has been listed by OSHA as a potential cancer hazard.



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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