Beryllium

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer / Supplier:

ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 * Fax (541) 488-8313

E-Mail: sales@espimetals.com

Product Name: Beryllium

Formula: Be

CAS Number: 7440-41-7

II. HAZARDOUS INGREDIENTS

Hazardous Component: Beryllium

Percent (%): 0-100

OSHA/PEL: 0.002 mg/m^3

ACGIH/TLV: 0.002 mg/m^3

HMIS Ratings (Powder):

Health: 3

Flammability: 1

Reactivity: 0

HMIS Ratings (Foil):

Health: 2

Flammability: 0

Reactivity: 0

III. PHYSICAL DATA

Boiling Point: 2970 ºC

Melting Point: 1283 ºC

Specific Gravity: 1.85 g/cc

Solubility in H_2O: Insoluble

Appearance and Odor: Grey metal or powder, no odor

IV. FIRE AND EXPLOSION HAZARDS DATA

Flash Point: Non-combustible as a solid. Ignition occurred as a powder layer consisting of 1.0 to 5.0 micron particles between 540 ºC and 700 ºC. Coarser beryllium powder able to pass through a 74 micron sieve did not ignite under like testing.

Explosive limits: Not applicable to solids. As a cloud of 1.0 micron diameter powder ignition occurred at 910 ºC. Beryllium powder greater than or equal to 2 microns in diameter did not ignite under like conditions. Regardless of powder size tested beryllium did not ignite as a cloud in a spark apparatus.

Extinguishing Media: As a solid, use extinguishing media appropriate to the surrounding fire. Do not use water or carbon dioxide to extinguish beryllium powder fires. As a powder, extinguish by smothering using a Class D fire extinguisher, dry sand, graphite powder, or sodium chloride.

Special Fire Fighting Procedures: If this material becomes airborne as a respirable particulate during a fire situation, pressure- demand self-contained breathing apparatus must be worn by firefighters or any other persons potentially exposed to the metal fumes.

Unusual Fire and Explosion Hazard: Do not use water to extinguish fires around operations involving molten metal due to the potential for steam explosions. In addition, water may disassociate when in contact with burning beryllium powder or chips releasing flammable hydrogen gas which could burn and result in an explosion. Ventilation duct work which has accumulated a fine coating of beryllium dust on its internal surface poses a potentially serious fire hazard. Extinguishing using Class D fire extinguisher media and shut down or isolate the affected portion of the ventilation system. Because of this potential risk, sources of ignition such as flame, spark, etc. must not be allowed to enter the ventilation duct work. Also, duct work must be made of non-combustible material.

V. HEALTH HAZARD INFORMATION

Primary Routes of Exposure: Exposure to beryllium by inhalation, ingestion and skin contact can occur when melting, casting, dross handling, pickling, chemical cleaning, heat treating, abrasive cutting, welding, grinding, sanding, polishing, milling, crushing, or otherwise heating or abrading the surface of this material in a manner which generates particulate. Exposure may also occur during repair or maintenance activities on contaminated equipment such as: furnace rebuilding, maintenance or repair of air cleaning equipment, structural renovation, welding, etc. Particulate depositing on hands, gloves, and clothing, can be transferred to the breathing zone and inhaled during normal hand to face motions such as rubbing of the nose or eyes, sneezing, coughing, etc.

Acute Effects:

Inhalation: Not know to cause acute health effects.

Ingestion: Not know to cause acute health effects.

Skin: Skin abrasion may cause irritation.

Eye: Injury to the eyes can result from particulate irritation or mechanical injury to the cornea or conjunctiva by dust or particulate.

Chronic Effects:

Inhalation: Inhaling particulate containing beryllium may cause a serious, chronic lung disease called Chronic Beryllium Disease (CBD) in some individuals. Over time lung disease can be fatal. Chronic beryllium disease is a hypersensitivity or allergic condition in which the tissues of the lungs become inflamed. This inflammation, sometimes with accompanying fibrosis (scarring), may restrict the exchange of oxygen between the lungs and the bloodstream. Medical science suggests that CBD may be related to genetic factors.

Ingestion: Chronic health effects unknown.

Skin: Particulate that becomes lodged under the skin has the potential to induce sensitization and skin lesions.

Eye: Damage can result from irritation or mechanical injury to the eyes by particulate.

Carcinogenicity: **IARC**: Yes **NTP**: Yes **ACGIH**: Yes

Medical Conditions Aggravated by Exposure: Persons with impaired pulmonary function, airway diseases, or conditions such as asthma, emphysema, chronic bronchitis, etc. may incur further impairment if excessive concentrations of dust or fume are inhaled. If prior damage or disease to the neurologic (nervous), circulatory, hematologic (blood), or urinary (kidney) system has occurred, proper screening or examinations should be conducted on individuals who may be exposed to further risk where handling and use of this material may cause excessive exposure.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove to fresh air, keep warm and quiet, give oxygen if breathing is difficult. Seek medical attention.

INGESTION: Give 1-2 glasses of milk or water and induce vomiting, seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

SKIN: Thoroughly wash skin cuts or wounds to remove all particulate debris from the wound. Seek medical attention for wounds that cannot be thoroughly cleansed. Treat skin cuts and wounds with standard first aid practices such as cleansing, disinfecting and covering to prevent wound infection and contamination before continuing work. Obtain medical help for persistent irritation. Material accidentally implanted or lodged under the skin must be removed.

EYE: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention immediately.

VI. REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Oxidation will form on solid shapes when moist.

Incompatibility (Material to Avoid): Avoid contact with mineral acids and oxidizing agents which may generate hydrogen gas. Hydrogen gas can be an explosion hazard.

Hazardous Decomposition Products: Toxic metal oxide fume.

Hazardous Polymerization: Will not occur

VII. SPILL AND LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled: In solid form this material poses no health or environmental risk. If this material is in powder or dust form, establish a restricted entry zone based on the severity of the spill. Persons entering the restricted zone must wear adequate respiratory protection and protective clothing appropriate for the severity of the spill. Cleanup should be conducted with a vacuum system utilizing a high efficiency particulate air filtration system followed by wet cleaning methods. Special care must be taken when changing filters on HEPA vacuum cleaners when used to clean up potentially toxic materials. Caution should be taken to minimize airborne generation of powder or dust and avoid contamination of air and water. Depending upon the quantity of material released, fine powder or dust spills to the environment may require reporting the National Response Center at (800) 424-8802 as well as the State Emergency Response Commission and Local Emergency Planning Committee.

Waste Disposal Method: Dispose of in accordance with State, Federal and Local regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: When potential exposures are above the occupational limits, approved respirators must be used. Exposure to unknown concentrations of fumes or dusts requires the wearing of a pressure-demand self-contained breathing apparatus. Pressure-demand airline respirators are recommended for jobs with high potential exposures such as changing bags in a baghouse air cleaning device.

Ventilation: Whenever possible the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne dust and fume to meet established occupational exposure limits. Powders should be stored and transported in tightly sealed containers and must only be handled under controlled ventilated conditions.

Protective Gloves: Wear gloves to prevent contact with particulate or solutions and to prevent metal cuts and skin abrasions particularly during handling.

Eye Protection: Wear safety glasses, goggles, face shield, or welders helmet.

Other Protective Equipment: Protective overgarments or work clothing must be worn by persons who may become contaminated with particulate during activities such as machining, furnace rebuilding, air cleaning equipment filter changes, maintenance, furnace tending, etc. Contaminated work clothing and overgarments must be managed in a controlled manner to prevent secondary exposure to workers of third parties, to prevent the spread of particulate to other areas, and to prevent particulate from being taken home by workers.

Housekeeping: Use vacuum and wet cleaning methods for particulate removal from surfaces. Be certain to de-energize electrical systems as necessary before beginning wet cleaning. Use vacuum cleaners with high efficiency particulate air (HEPA) filters. Do not use compressed air, brooms, or conventional vacuum cleaners to remove particulate from surfaces as this activity can result in elevated exposures to airborne particulate. Follow the manufacturer's instructions when performing maintenance on HEPA filtered vacuums used to clean hazardous materials.

IX. SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Keep storage container tightly sealed. Transfer material in closed systems or within a completely hooded containment with local exhaust ventilation. Prevent spillage. Prevent contact with clothing. Flush container clean before discarding. Store in a dry area.

Other Precautions: Particulate may enter the body through cuts, abrasions or other wounds on the surface of the skin. Wear gloves when handling parts with loose surface particulate or sharp edges.

Work Practices: Develop work practices and procedures that prevent particulate from coming in contact with worker skin, hair, or personal clothing. If work practices and/or procedures are ineffective in controlling airborne exposure or visual particulate from deposition on skin, hair, or clothing, provide appropriate cleaning/washing facilities. Procedures should be written that clearly communicate the facility's requirements for protective clothing and personal hygiene. These clothing and personal hygiene requirements help keep particulate from being spread to non-production areas or from being taken home by the worker. Never use compressed air to clean work

clothing or other surfaces.

Fabrication processes may leave a residue of particulate on the surface of parts, products or equipment that could result in employee exposure during subsequent material handling activities. As necessary, clean loose particulate from parts between processing steps. As a standard hygiene practice, wash hands before eating or smoking.

To prevent exposure, remove surface scale or oxidation formed on cast or heat treated products in an adequately ventilated process prior to working the surface.

TSCA Listed: Yes

DOT Regulations:

Solid Forms:

Hazard Class: None

Powders:

Hazard Class: 6.1

Identification Number: UN1567

Packing Group: II

Proper Shipping Name: Beryllium, Powder

Label(s) Required: TOXIC, FLAMMABLE SOLID

Reportable Quantity: 4.54 kg (10 lbs)

Emergency Response: Emergency response must be provided on the shipping document

SARA Title III: Beryllium is reportable under Section 313

NIOSH RTECS#: DS1750000

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

Issued by: S. Dierks

Revised/Verified: July 2011