MATERIAL SAFETY DATA SHEET

BERYLLIUM SOLID

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CUSTOMER SERVICE

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24-Hr. EMERGENCY ASSISTANCE

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1. Product Identification

COMMON NAME:	Beryllium
SYNONYMS:	Beryllium Metal
CHEMICAL NAME:	Beryllium
FORMULA:	Be
LABEL IDENTITY:	Beryllium Product
CHEMICAL FAMILY:	Metal

2. Chemical Composition and Physical Properties

2.1. CHEMICAL COMPOSITION: Beryllium 100 %

2.2. PHYSICAL PROPERTIES:

Atomic Number: 4

Atomic Weight: 9.01

Boiling Point: 2970 °C

Evaporation Rate: NA

Freezing Point: NA

Odor: None

pH: NA

Physical State: Solid

Radioactivity: NA

Solubility in Water: None

Sublimes: NA

Vapor Density: NA

Vapor Pressure: NA

% Volatiles By Volume: None

Color: Gray Metallic

Melting Point : 1285 °C

Density (g/cc): 1.85

NA - Not applicable

3. Occupational Standards and References

Constituents	SS* 1.02.011-94 LPC	OSHA* PEL CEILING PEAK	ACGIH* TLV TLV-STEL	CAS Number
Beryllium	0.001	0.002 0.005 0.025	0.002 NA	7440-41-7

* All concentrations are in milligrams per cubic meter of air.

SS Sanitary standards of Republic of Kazakhstan

LPC Limit Permissible Concentration

OSHA Occupational Safety and Health Administration

PEL Eight Hour Average Permissible Exposure Limit

CEILING Not TO BE Exceeded Except For Peak Limit

PEAK 30 minute Maximum Duration Concentration Above Ceiling Limit

ACGIH American Conference of Governmental Industrial Hygienists

TLV Eight Hour Average Threshold Limit Value

CAS Chemical Abstract Service

This constituent may not be visible to the human eye at the concentrations noted above.

4. Fire, Explosion and Reactivity Information

Flash Point Not applicable to solids

Explosive Limits Not applicable to solids

Extinguishing Media As solid, use extinguishing media appropriate to the

	surrounding fire. To extinguish a metal powder use dry sand, graphite powder, NaCl, CaF2, MgF2, or class D fire extinguishing powder.
Unusual fire and Explosion Hazards	Do not use water to extinguish fires around operations involving molten metal due to the potential for steam explosions.
	A T T E N T I O N !
	Water may dissociate when in contact with burning beryllium dust, powder or chips releasing flammable hydrogen gas which could burn and result in an explosion.
Special fire Fighting Procedures	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.
General Reactivity	The solid beryllium is stable.
Incompatibility	Exclude contact with mineral acids and oxidizing agents which may generate hydrogen gas. Hydrogen can be an explosion hazard.
Hazardous Decomposition Products	Melting and dross handling of powdering operations can emit airborne dusts or fumes. See Section 3 for permissible exposure limits.
Hazardous Polymerization	Will not occur.

5. Health Hazard Information

5.1. Primary Routes of Exposure

Inhalation: In solid form beryllium poses no health hazard. However, overexposure to beryllium aerosols (fumes) or beryllium dust by inhalation may cause a serious chronic lung disease, in certain sensitive individuals, called chronic berylliosis.

An exposure to airborne beryllium in excess of occupational standard can occur when melting, casting, dross handling, picking, welding, grinding, sanding, or otherwise machining, polishing, milling, crushing or otherwise abrading the surface of solid beryllium. The potential for exposures also may occur during repair or maintenance of the contaminated technological equipment, air cleaning equipment, etc.

Ingestion: There are no known cases of illness from ingestion of beryllium. Ingestion can occur from food, drink, hand and clothing contact with metal powder, dust or fume during eating, drinking, smoking, etc. This product is not intended for internal consumption. As a usual hygiene practice, hands should be washed before smoking, eating or drinking.

Skin: Solid beryllium does not pose a potential for an allergic dermal response or skin absorption. This product can be safely handled with bare hands.

Eyes: Hurt to the eyes can result from irritation or mechanical hurt to the cornea or conjuctiva by dust or particulate. Exposure may result from direct contact with airborne particulate or contact to the eye of contaminated hands or clothing.

5.2. Effects of Overexposure

Acute:

Beryllium does not cause acute health effects

Chronic:

Serious lung disease called chronic berylliosis can result from inhalation of beryllium dust or fumes. Chronic berylliosis is a condition in which the tissues of the lungs become inflamed, restricting the exchange of oxygen between the lungs and the bloodstream. Symptoms may include shortness of breath, cough, chest pain, weight loss, fatigue and weakness. Long-term effects may include loss of lung function or secondary effects on the heart with eventual permanent impairment.

Carcinogenic References:

Beryllium is a potential carcinogen according to the list of the International Agency for Cancer Research Monograph Series. It has been so listed based principally on animal tests and therefore beryllium bears a label identifying it as a potential cancer hazard.

Medical Conditions Aggravated by Exposure:

Persons with airway disease, impaired pulmonary function or conditions such as asthma, emphysema, chronic bronchitis may incur further impairment if excessive concentrations of beryllium dust or fume are inhaled. If prior damage or disease to the neurologic, hematologic, circulatory, urinary systems has occurred, proper screening or examinations should be conducted on individuals who may be exposed to further risk where handling and use of beryllium may cause excessive exposure.

6. Emergency and First Aid Procedures

Inhalation:

Breathing difficulty caused by inhalation of beryllium dust or fume requires immediate removal to fresh air. The cases in which a person stopped breathing as result of exposure are not known. But, if breathing has stopped, perform artificial respiration and obtain medical help.

Ingestion:

Swallowing beryllium can be treated by having the affected person drink large quantities of water and attempting to induce vomiting if conscious. Obtain medical help.

Skin:

Skin cuts and abrasions can be treated by usual first aid. Skin contamination with beryllium can be removed by washing with soap and water. If irritation persists, obtain medical help. Accidental implantation of beryllium beneath the skin requires it be removed to prevent injection or development of corn-like lesion.

Eyes:

Beryllium dust or powder should be flushed from the eyes with copious mounts of clean water. If irritation persists, obtain medical help. Contact lens should not be worn when working with dusts and powders because the contact lens must be removed to provide adequate treatment.

7. Occupational Control Measures

Respiratory Protection:

When potential exposures are above the occupational limits, shown in Section 3 or National Standards, approved respiration must be used as specified by an Industrial Hygienist or other qualified professional. Users of respirator should be medically evaluated to determine if they are physically capable of wearing a respirator. Respirator training and quantitative and/or qualitative fit testing must be satisfactorily completed by all personnel prior to respirator use in environment where concentrations of airborne dusts or fumes may exceed the occupational standards. Exposure to unknown concentrations of beryllium dust or fume requires the wearing of pressure-demand airline respirator or pressure-demand self-contained breathing apparatus.

Eye Protection:

Wear safety glasses, goggles, face shield or welders helmet when risk of eye injury is present. This risk is present particularly during melting, casting, welding, machining, powder handling, etc.

Protective Gloves:

Wear gloves to prevent metal cuts and skin abrasions particularly during handling, machining and other contact operations of solid beryllium.

Other Protective Equipment:

Protective equipment or clothing is not required when handling solid forms. Protective overgarments or work clothing should be worn by persons who may become contaminated with dusts, powders or fumes during activities as furnace rebuilding, air cleaning equipment bag changes, furnace tending, etc. Contaminated work clothing should be managed in such a manner so as to prevent secondary exposure to persons such as laundry operators and to prevent contamination to personal clothing. Do not use compressed air to clean work clothing.

Ventilation and Engineering Controls:

Whenever possible the use of local exhaust ventilation is the preferred method of controlling exposure to airborne dust and fume to meet established occupational exposure limits. Pickups on flexible ventilation lines should be positioned as close to the source of airborne contamination as possible.

Ventilation equipment should be checked regularly to ensure it is functioning properly. For all users, ventilation training is recommended.

Housekeeping:

Wet or vacuum cleaning methods are recommended for contamination removal. Be certain to de-energerize electrical systems as necessary before starting wet cleaning.

The use of compressed air to remove dusts should be avoided as such an activity can result in unnecessary short-term elevated

exposures to dusts.

Maintenance:

During repair or maintenance activities the potential exists for exposures to beryllium in excess of the occupational standards. Under such conditions, protecting workers can require the use of specific practices or procedures including the combined use of ventilation, respiratory protection, special protecting clothing, decontamination and necessary restricted work zones.

Welding:

Welding or cutting of beryllium-containing materials shall be done using local exhaust ventilation and individual respirators unless atmospheric tests under the most adverse conditions have established that the workers exposure is within the acceptable concentrations defined by National Standards.

Environmental Surveillance:

Exposures to beryllium should be determined by having air samples taken in employee breathing zone, work area, and shop. The type and frequency of air sampling should be as specified by Sanitary Rules, Industrial Hygienist or other qualified professional. Results of air sample should be made available to employees.

Medical Surveillance:

Periodic lung function tests, chest X-rays, and physical examinations should be used to monitor the potential effects of beryllium exposure.

8. Environmental Protection Information

Steps to Be Taken if Material is Released or Spilled Solid beryllium poses no health or environmental risk. If beryllium is in powder or dust form, establish a restricted entry zone based on the severity of the spill. All persons entering this zone must wear adequate respiratory protection and protection clothing. Cleanup should be conducted with a vacuum system utilizing a high efficiency air filtration system followed by wet cleaning. Caution should be taken to minimize airborne of powder or dust and avoid contamination of air, water and surfaces of equipment and buildings. Depending upon the quantity of material released to the environment may require reporting to national or regional government.

Solid Waste Management:

Beryllium scrap, chips and powder are normally recycled. In cases when this is impossible, we recommend metallic beryllium waste in form of dust or powder be sealed within two plastic bags and then placed within a container approved for flammable solids. The outer container must be labeled in accordance with requirements for hazardous waste container label, also be followed when disposing of dust collector filters contaminated with metallic beryllium dust.

Ambient Air Emissions:

Beryllium and its alloys users involving outplant emissions are subject to the National Emission Standard for Beryllium. Emissions should not cause deviations from The National Environmental Standard . The National Standards of Republic of Kazakhstan, Russia, USA provide for beryllium content in ambient the air of populated areas of 0,01 micrograms per cubic meter . Most process air emission sources exhausting outside a production building will require an air permit from a regional and/or national air pollution control agency.

Wastewater:

Wastewater regulations can vary considerably. Contact your local and national governments to determine what conditions apply.

For USA Users: You may obtain additional information about beryllium by calling the EPA SARA Title III Hotline at 1-800-535-0202 (02 202-555-1411).

9. Packaging and Labeling Requirements

There are no hazardous material regulations which apply to the packaging and labeling of beryllium as shipped by UMP. But International regulations require that this product be labeled. Following is the label text which accompanies material during shipment.

> Beryllium Danger ! Inhalation of dust or fumes may cause serious chronic lung disease. Potential cancer hazard based principally on animal tests. This product contains beryllium. When handling this product in its solid form it poses no hazard. However, overexposure to beryllium dust or fumes by inhalation may cause berylliosis, serious chronic disease.
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> If processing of the solid form produces dust or fumes, use only with exhaust ventilation or other controls designed to meet national standards. This product is sold for manufacturing purposes only. Can be recycled. See Material Safety Data Sheets on file your employer for further details concerning precautionary measures. Assistance in establishing safe procedures may be obtained by contacting "UMP" OSC: 102, Abay Ave. Ust-Kamenogorsk, Republic of Kazakhstan, Phone (3232)-29 81 03.

Label may vary in size Label color - white If you have any questions or require additional information regarding materials described in this Material Safety Data Sheet, please telephone or write at the location mentioned on page 1.

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