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## 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name : Hafnium - chips, pellets, wire, rod, foil, sheet, target  
Formula : Hf  
Brand : ALB  
Recommended Use : Scientific research and engineering development

Company : ALB Materials Inc  
2360 Corporate Circle . Suite 400  
Henderson, NV 89074-7739

Web : [www.albmaterials.com](http://www.albmaterials.com)  
E-mail : [sales@albmaterials.com](mailto:sales@albmaterials.com)  
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## 2. HAZARDS IDENTIFICATION

GHS Classification (29 CFR 1910.1200): Not classified as hazardous

GHS Label Elements:

Signal Word: N/A

Hazard Statements: N/A

Precautionary Statements: N/A

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient: Hafnium  
CAS#: 7440-58-6  
%: 97-99.8  
EC#: 231-166-4

Ingredient: Zirconium  
CAS#: 7440-67-7  
%: 0.02-3  
EC#: 231-176-9

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## 4. FIRST AID MEASURES

General Measures: No special requirements.

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

INGESTION: Rinse mouth with water. Do not induce vomiting. Seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

SKIN: Remove contaminated clothing, brush material off skin, wash affected area with soap and water. Seek medical attention if symptoms develop or persist.

EYES: Flush eyes with lukewarm water, including under upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms develop or persist.

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation. See section 11 for more information.

Indication of Immediate Medical Attention and Special Treatment: No other relevant information available.

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## 5. FIRE-FIGHTING MEASURES

Extinguishing Media: Use suitable extinguishing agent for surrounding materials and type of fire.

Unsuitable Extinguishing Media: No information available.

Specific Hazards Arising from the Material: This product does not present fire or explosion hazards as shipped. Fine dust from processing may ignite if allowed to accumulate and subjected to an ignition source. May emit toxic metal oxide fumes under fire conditions.

Special Protective Equipment and Precautions for Firefighters: Full face, self-contained breathing apparatus and full protective clothing when necessary.

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## 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures: Wear appropriate respiratory and protective equipment specified in section 8. Isolate spill area and provide ventilation. Avoid breathing dust or fume. Avoid contact with skin and eyes. Eliminate all sources of ignition.

Methods and Materials for Containment and Cleaning Up: Avoid dust formation. Sweep or scoop up. Place in properly labeled closed containers. Scrap can be collected for recycling.

Environmental Precautions: Do not allow to be released to the environment.

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## 7. HANDLING AND STORAGE

Precautions for Safe Handling: Avoid creating dust. Provide adequate ventilation if dusts are created. Avoid breathing dust or fumes. Avoid contact with skin and eyes. Wash thoroughly before eating or smoking. See section 8 for information on personal protection equipment.

Conditions for Safe Storage: Store in a cool, dry area. See section 10 for more information on incompatible materials.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits: Hafnium

OSHA/PEL: 0.5 mg/m<sup>3</sup>

ACGIH/TLV: 0.5 mg/m<sup>3</sup>

Engineering Controls: Ensure adequate ventilation to maintain exposures below occupational limits. 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. Use good housekeeping and sanitation practices. Do not allow dusts to accumulate as they may present a serious fire hazard. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air.

Respiratory Protection: If permissible levels are exceeded, use NIOSH approved dust respirator.

Eye Protection: Safety glasses

Skin Protection: Wear impermeable gloves, protective work clothing as necessary.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Form: Solid in various forms

Color: Silver gray metallic

Odor: Odorless

Odor Threshold: Not determined

pH: N/A

Melting Point: 2227±20 oC

Boiling Point: 4602 oC

Flash Point: N/A

Evaporation Rate: N/A

Flammability: No data

Upper Flammable Limit: No data

Lower Flammable Limit: No data

Vapor Pressure: No data

Vapor Density: N/A

Relative Density (Specific Gravity): 13.31 g/cc @ 20 oC

Solubility in H<sub>2</sub>O: Insoluble

Partition Coefficient (n-octanol/water): Not determined

Autoignition Temperature: No data

Decomposition Temperature: No data

Viscosity: N/A

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## 10. STABILITY AND REACTIVITY

Reactivity: No data

Chemical Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hafnium fines will burn when exposed to an ignition source. Dust dispersed in air may be explosive. Keep fine turnings completely dry, or very wet. If wet, the water content should be more than 25% by weight for maximum safety in handling. Severe explosions can result from ignition of hafnium powder or machining fines containing moisture in the concentration range of 5 to 10%.

Conditions to Avoid: Avoid creating or accumulating fines or dusts. Avoid all sources of ignition.

Incompatible Materials: Hydrofluoric acid, hydrofluoric-nitric acid mixture, fluorine, chlorine, bromine, iodine, halocarbons, carbon tetrachloride, carbon tetrafluoride, freons, nitryl-fluoride.

Hazardous Decomposition Products: Hafnium oxide fume.

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## 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Inhalation, skin, eyes.

Symptoms of Exposure: May cause irritation if dusts or fumes are inhaled or swallowed. Fines/dusts may irritate skin and eyes.

Acute and Chronic Effects:

Hafnium: Hafnium metal is a mild irritant of the eyes, skin, and mucous membranes. No industrial poisonings involving hafnium have been reported.

Zirconium: Zirconium is generally considered to be physiologically inert.

Acute Toxicity: No data

Carcinogenicity: NTP: Not identified as carcinogenic IARC: Not identified as carcinogenic

To the best of our knowledge the chemical, physical and toxicological characteristics of the substance are not fully known.

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## 12. ECOLOGICAL INFORMATION

Ecotoxicity: No data

Persistence and Degradability: No data

Bioaccumulative Potential: No data

Mobility in Soil: No data

Other Adverse Effects: Do not allow material to be released to the environment without proper governmental permits. No further relevant information available.

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## 13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Product: Dispose of in accordance with Federal, State and Local regulations.

Packaging: Dispose of in accordance with Federal, State and Local regulations.

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## 14. TRANSPORT INFORMATION

Shipping Regulations: Not regulated

UN Number: N/A  
UN Proper Shipping Name: N/A  
Transport Hazard Class: N/A  
Packing Group: N/A  
Marine Pollutant: No

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## 15. REGULATORY INFORMATION

TSCA Listed: All components are listed.

Regulation (EC) No 1272/2008 (CLP): N/A

Canada WHMIS Classification (CPR, SOR/88-66): N/A

HMIS Ratings: Health: 0 Flammability: 0 Physical: 0

NFPA Ratings: Health: 0 Flammability: 0 Instability: 0

Chemical Safety Assessment: A chemical safety assessment has not been carried out.

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## 16. OTHER INFORMATION

### Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.

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