

# Hafnium

## 1 PRODUCT AND SUPPLIER IDENTIFICATION

Product Name: Hafnium - pellets, wire, rod, foil, sheet, target

Formula: Hf

Supplier: Eagle Alloys Corporation  
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**24 HOUR EMERGENCY ASSISTANCE:** CHEMTREC 800-424-9300

Recommended Uses: Scientific Research

## 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

## 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

## 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.

## Hafnium SAFETY DATA SHEET

**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.

### 5 FIREFIGHTING MEASURES

**Extinguishing Media:** Use Class D dry powder extinguishing agent or dry table salt.

**Unsuitable Extinguishing Media:** Do not use water, carbon dioxide or halogenated extinguishing agents.

**Specific Hazards Arising from the Material:** This product does not present fire or explosion hazards as shipped. Small chips, fine turnings and dust from processing may be readily ignitable. 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.

**Additional Information:** If metal fines ignite, allow the material to burn out. Control small fires by smothering with dry table salt or using a type D extinguisher. Separate burning material from larger mass, and allow it to burn out. Do not spray water on burning hafnium. Carbon dioxide is not effective in extinguishing burning hafnium either. If a fire starts in a mass of wet metal fines, an explosion may follow due to rapidly expanding gases. The explosive characteristic of such material is caused by the steam and hydrogen generated within the burning mass.

### 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 container for further handling and disposal. If cleaning up fines or dusts use only non-sparking tools and natural bristle brushes.

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

### 7 HANDLING AND STORAGE

**Precautions for Safe Handling:** Avoid dust formation. Keep finely divided hafnium away from any source of ignition and cleaned up immediately. This material is generally not considered hazardous in its solid form. However, if your process creates fines or dusts precautions must be taken. Machining of hafnium may result in fine turnings or chips. Any material with a dimension less than 0.0625" (1/16") or a cross section less than 0.0078" square (1/16 x 1/8), if present in any quantity, can be ignited and can sustain combustion. Keep away from any source of ignition. 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. Store away from acids. See section 10 for more information on incompatible materials.

### 8 EXPOSURE CONTROLS AND 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.

## Hafnium SAFETY DATA SHEET

**Eye Protection:** Safety glasses

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

### 9 PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:**

<b>Form:</b>	Solid in various forms
<b>Color:</b>	Silver gray metallic
<b>Odor:</b>	Odorless
<b>Odor Threshold:</b>	Not determined
<b>pH:</b>	N/A
<b>Melting Point:</b>	2227±20 °C
<b>Boiling Point:</b>	4602 °C
<b>Flash Point:</b>	N/A
<b>Evaporation Rate:</b>	N/A
<b>Flammability:</b>	No data
<b>Upper Flammable Limit:</b>	No data
<b>Lower Flammable Limit:</b>	No data
<b>Vapor Pressure:</b>	No data
<b>Vapor Density:</b>	N/A
<b>Relative Density (Specific Gravity):</b>	13.31 g/cc @ 20 °C
<b>Solubility in H<sub>2</sub>O:</b>	Insoluble
<b>Partition Coefficient (n-octanol/water):</b>	Not determined
<b>Autoignition Temperature:</b>	No data
<b>Decomposition Temperature:</b>	No data
<b>Viscosity:</b>	N/A

### 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.

### 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.

## Hafnium SAFETY DATA SHEET

### 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.

### 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.

### 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

### 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.

### 16 OTHER INFORMATION

The information contained in this document is based on the state of our knowledge at the time of publication and is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. Eagle Alloys Corporation makes no representation, warranty, or guarantee of any kind with respect to the information contained in this document or any use of the product based on this information. Eagle Alloys Corporation shall not be held liable for any damages resulting from handling or from contact with the above product. Users should satisfy themselves that they have all current data relevant to their particular use.

**Prepared by:** Eagle Alloys Corporation

**Revised/Reviewed:** November 2015

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