



MATERIAL SAFETY DATA SHEET
COMPLIES WITH 29 CFR 1910.1200.
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 05-18-07

CHEMICAL IDENTITY

LABEL IDENTITY	HAFNIUM		
CHEMICAL NAME/SYNONYMS	CRYSTAL BAR HAFNIUM		
FORMULA	Hf		
CHEMICAL FAMILY	METAL		
CAS REGISTRY NUMBER	7440-58-6 (Hf)	7440-67-7 (Zr)	
HAZARDOUS INGREDIENTS	HAFNIUM, ZIRCONIUM		
Hf %:	99.8	TLV: 0.5mg/m3	OSHA/PEL: not established
Zr %:	0.05	TLV: 5mg/m3	OSHA/PEL: not established

PHYSICAL AND CHEMICAL PROPERTIES

COLOR, FORM AND ODOR	Gray-black, odorless
BOILING POINT	4600°C
DENSITY (gm/cc)	NA
VAPOR PRESSURE @ 20°	0 @ 20°C
% VOLATILE BY VOLUME (%)	Non-volatile
REACTION WITH WATER	NA
EVAPORATION RATE (H2O=1)	None
SOLUBILITY IN WATER	Insoluble
MELTING POINT	2227 + 20°C

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	ND
AUTOIGNITION TEMPERATURE (° C)	NA
FLAMMABILITY	NA
EXTINGUISHING MEDIA	Use dry chemical, class D extinguisher
SPECIAL FIRE FIGHTING PROCEDURES	Wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing
UNUSUAL FIRE & EXPLOSION HAZARDS	DO NOT SPRAY WATER ON FIRES. Fine chips, turnings, sawdust or grinding dust produced may be flammable.



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HEALTH HAZARD INFORMATION

TOXICITY DATA

No known toxicity

HMIS RATING:

HEALTH: **0** FLAMMABILITY: **0** REACTIVITY: **0** PERSONAL PROTECTION: **ND**

ROUTES OF ENTRY

INHALATION: **ND**
SKIN: **ND**
INGESTION: **ND**

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

NA

EFFECTS OF OVEREXPOSURE (acute and chronic):

INHALATION: **none known**

DERMAL/EYE CONTACT: **none known**

OTHER: **no industrial disease has been evident with up to 20 years of exposure of Hafnium compounds**

CARCINOGENICITY: NTP: **no** IARC MONOGRAPHS: **no** OSHA REGULATE: **no**

EMERGENCY FIRST AID PROCEDURES:

INGESTION: **Administer water and induce vomiting, seek medical attention**

INHALATION: **Remove to fresh air, seek medical attention**

SKIN CONTACT: **Wash affected area with soap and water, seek medical attention**

EYE CONTACT: **Flush eyes for at least 15 minutes with lukewarm water, seek medical.**

REACTIVITY DATA

STABILITY

Stable

CONDITIONS CONTRIBUTING TO UNSTABILITY

ND

INCOMPATIBILITY (MATERIALS TO AVOID)

Strong acids

HAZARDOUS DECOMPOSITION PRODUCTS

Does not decompose

HAZARDOUS POLYMERIZATION

Will Not Occur

CONDITIONS TO AVOID

Incompatible materials



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SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Wear full protective clothing, isolate area and ensure proper ventilation, vacuum spill and place in container for proper disposal.

WASTE DISPOSAL METHOD:

Consult federal, state and local regulations for proper disposal. Can be burned under controlled conditions

SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION	NIOSH approved respirator
LOCAL EXHAUST	NA
MECHANICAL (general)	NA
SPECIAL	NA
OTHER	NA
PROTECTIVE GLOVES	Recommended
EYE PROTECTION	Safety glasses with side shields
OTHER PROTECTIVE EQUIPMENT	Maintain sink, safety shower, and eyewash fountain in work area. Wear full protective clothing. DO NOT accumulate large quantities of fines or machining residue.

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE:

Store in tightly closed containers in a cool, dry place. Wash hands and face thoroughly after handling and before eating.

TRANSPORTATION REQUIREMENTS	DOT CLASS:	Non hazardous
	UN NUMBER:	ND
	IMCO CLASS:	ND
	OTHER:	

PRECAUTIONARY LABELING **NONE**

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, **ANGSTROM SCIENCES** MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

NA= NOT APPLICABLE

ND= NO DATA FOUND