MATERIAL SAFETY DATA SHEET
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 06-10-96

CHEMICAL IDENTIFICATION

<table>
<thead>
<tr>
<th>Label Identity</th>
<th>Zinc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Name/Synonyms</td>
<td>Zinc</td>
</tr>
<tr>
<td>Formula</td>
<td>Zn</td>
</tr>
<tr>
<td>Chemical Family</td>
<td>Zinc</td>
</tr>
<tr>
<td>CAS Registry Number</td>
<td>7440-66-6</td>
</tr>
<tr>
<td>Hazardous Ingredients</td>
<td>Zinc</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH/TLV</td>
<td>TWA 5.0mg/m³</td>
</tr>
<tr>
<td>OSHA/PEL</td>
<td>TWA 5.0mg/m³</td>
</tr>
</tbody>
</table>

PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color, Form and Odor</td>
<td>Gray powder, odorless</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>908°C</td>
</tr>
<tr>
<td>Density (gm/cc)</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Pressure @ 20°</td>
<td>NA</td>
</tr>
<tr>
<td>% Volatile by Volume (%)</td>
<td>NA</td>
</tr>
<tr>
<td>Reaction with Water</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate (H₂O=1)</td>
<td>NA</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Melting Point</td>
<td>419.8°C</td>
</tr>
</tbody>
</table>

FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>Flammable solid</td>
</tr>
<tr>
<td>Autoignition Temperature (°C)</td>
<td>NA</td>
</tr>
<tr>
<td>Flammability</td>
<td>NA</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Class D fire extinguishing media only</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td>DO NOT USE WATER!!!, wear SCBA, violent reaction with water, may explode</td>
</tr>
<tr>
<td>Unusual Fire &amp; Explosion Hazards</td>
<td>Dust explosion hazard</td>
</tr>
</tbody>
</table>
ZINC
MATERIAL SAFETY DATA SHEET

HEALTH HAZARD INFORMATION

TOXICITY DATA

skn-hmn 200ug/3D-I: MLD
ihl-hmn TCLO: 124mg/m3/50M: PUL, SKN
*(for more: SEE ATTACHED SHEET)*

HMIS RATING:

HEALTH: na  FLAMMABILITY: na  REACTIVITY: na  PERSONAL PROTECTION: na

ROUTES OF ENTRY

INHALATION: Yes
SKIN: Yes
INGESTION: Yes

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Pre-existing lung disease

EFFECTS OF OVEREXPOSURE (acute and chronic):

INHALATION: inhalation of freshly formed fumes may produce characteristic systems known as metal fume fever or zinc shakes. Only the freshly formed fume is potent.

DERMAL/EYE: mild (transient)

OTHER: chronic overexposure to Zn will produce chromosomal anomalies in leukocytes. Arthritic lameness and inflammation of the gastrointestinal tract reported in animal studies. May cause dermatitis.

CARCINOGENICITY: na  NTP: na  IARC MONOGRAPHS: na  OSHA REGULATE: na

EMERGENCY FIRST AID PROCEDURES:

INGESTION: seek medical attention, wash mouth out with water

INHALATION: remove to fresh air, if not breathing, give artificial respiration, seek medical attention, if breathing is difficult give oxygen

SKIN CONTACT: flush with soap and water

EYE CONTACT: flush eyes with plenty of water for at least 15 minutes

REACTIVITY DATA

STABILITY
Stable

CONDITIONS CONTRIBUTING TO UNSTABILITY
NA

INCOMPATIBILITY (MATERIALS TO AVOID)
strong acids, strong alkalis, air and moisture sensitive, halogens, amines, cadmium, chlorinated solvents, sulfur, catalytic metals, non-metals, oxidants.

HAZARDOUS DECOMPOSITION PRODUCTS
ZnO

HAZARDOUS POLYMERIZATION
NA

CONDITIONS TO AVOID
ignition sources
ZINC
MATERIAL SAFETY DATA SHEET

SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep or scoop up and remove, avoid raising dust. Evacuate area, shut off all sources of ignition, wear SCBA, ventilate area and wash spill site after material pickup is complete.

WASTE DISPOSAL METHOD:
Consult federal, state and local regulations for proper disposal procedure: This product contains chemical (s) subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-know Act of 1986 and 40 CFR 372.

SPECIAL PROTECTIVE INFORMATION

RE Respiratory Protection
FILTER, DUST MIST AND FUME
VENTILATION/ALWAYS USE BELOW
MAINTAIN EXPOSURE BELOW PERMISSIBLE EXPOSURE LIMITS

SPECIAL
NA

OTHER
NA

PROTECTIVE GLOVES
NATURAL RUBBER

EYE PROTECTION
GOGGLES

OTHER PROTECTIVE EQUIPMENT
WEAR PROTECTIVE CLOTHING TO PREVENT CONTAMINATION OF SKIN AND CLOTHES

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE: wash thoroughly after handling, don’t get in eyes, on skin or on clothing. Don’t breathe dust, vapor, mist, gas. Keep away from heat, sparks and open flames. Store in tightly closed containers, air and moisture sensitive.

TRANSPORTATION REQUIREMENTS
DOT CLASS: FLAMMABLE SOLID
UN NUMBER: NA
IMCO CLASS: NA
OTHER: NA

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
NR= NOT RECORDED
ATTACHED SHEET FOR: ZINC

TOXICITY DATA (CONTINUED)

Human systemic effects by ingestion: cough, dyspnea and sweating. Inhalation may cause sweet taste, throat dryness, weakness, generalized aches, chills, fever, nausea and vomiting. Exposure can cause chest pain and edema which may be fatal. Inhalation of freshly formed fumes may produce characteristic systems known as metal fume fever or zinc shakes. Only the freshly formed fume is potent.