MATERIAL SAFETY DATA SHEET
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 12-06-93

CHEMICAL IDENTITY

<table>
<thead>
<tr>
<th>LABEL IDENTITY</th>
<th>Gold Zinc Alloy</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORMULA</td>
<td>Au/Zn (99/1)</td>
</tr>
<tr>
<td>CHEMICAL FAMILY</td>
<td>Metallic Element</td>
</tr>
<tr>
<td>CAS REGISTRY NUMBER</td>
<td>Au: 7440-57-5  Zn: 7440-66-6</td>
</tr>
<tr>
<td>MOLECULAR WEIGHT</td>
<td>Au: 196.96654 Zn: 65.39</td>
</tr>
<tr>
<td>IS IT LISTED IN EPA TSCA INVENTORY</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*The data that follows is for the individual elements and not the mixture as a whole*

PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>COLOR, FORM AND ODOR</th>
<th>Yellow to silver, no odor</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>Unknown</td>
</tr>
<tr>
<td>DENSITY (gm/cc)</td>
<td>NA</td>
</tr>
<tr>
<td>VAPOR PRESSURE @ 20°</td>
<td>Unknown</td>
</tr>
<tr>
<td>% VOLATILE BY VOLUME (%)</td>
<td>NA</td>
</tr>
<tr>
<td>REACTION WITH WATER</td>
<td>ND</td>
</tr>
<tr>
<td>EVAPORATION RATE (H20=1)</td>
<td>0</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Insoluble</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTOIGNITION TEMPERATURE (°C)</td>
<td>NA</td>
</tr>
<tr>
<td>FLAMMABILITY</td>
<td>ND</td>
</tr>
<tr>
<td>EXTINGUISHING MEDIA</td>
<td>Non-flammable. If involved in a fire do not use water or halogenated extinguishers. Use dry chemical extinguishing agents, dry sand, dry ground dolomite.</td>
</tr>
</tbody>
</table>

SPECIAL FIRE FIGHTING PROCEDURES

No special fire fighting procedures needed, use normal procedures which include wearing NIOSH/MSHA approved self-contained breathing apparatus, flame and chemical resistant clothing; hats, boots and gloves. If without risk remove material from fire area.
GOLD ZINC ALLOY
MATERIAL SAFETY DATA SHEET

HEALTH HAZARD INFORMATION

ANIMAL TOXICITY DATA:

<table>
<thead>
<tr>
<th></th>
<th>LD50</th>
<th>LC50</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>No data</td>
<td>No data</td>
<td>imp-rat TDLO: 200mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>imp-mse TDLO: 21gm/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>int-rat LDLO: 58mg/kg</td>
</tr>
<tr>
<td>Zinc</td>
<td>No data</td>
<td>No Data</td>
<td>inh-hmn TCLO: 124mg/kg/</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>50minutes</td>
</tr>
</tbody>
</table>

HMIS RATING:

- HEALTH: 0
- FLAMMABILITY: 0
- REACTIVITY: 0
- PERSONAL PROTECTION: 0

ACUTE EFFECTS:

**Gold:**
- Ingestion: none known  
- Skin: powder may cause irritation  
- Eyes: powder may cause irritation  
- Inhalation: may cause irritation  
- Medical conditions, if any, aggravated by Gold: none known  
- Other likely hazards: effects of overexposure unlikely with solid forms  
- Most likely routes of entry: Ingestion

**Zinc:**
- Ingestion: may cause nausea, vomiting, purging  
- Skin: none known  
- Eyes: powder may be irritating  
- Inhalation: may cause metal fume fever. Symptoms include metallic taste, throat irritation, muscular aches, weakness, fever, nausea, vomiting and chills, may cause lung irritation, chest pain and edema.  
- Medical conditions, if any, aggravated by Germanium: none known  
- Other likely hazards: none known  
- Most likely route of entry: Ingestion

CHRONIC AFFECTS:

**Gold:**
- Ingestion: none known  
- Skin: may cause dermatitis  
- Eyes: none known  
- Inhalation: none known  
- Other: Aplastic anemia has been reported as an overexposure effect

**Zinc:**
- Ingestion: none known  
- Skin: none known  
- Eyes: none known  
- Inhalation: none known  
- Other: chromosomal anomalies in leukocytes reported. Arthritic lameness and inflammation of the gastrointestinal tract reported from animal studies.

EMERGENCY AND FIRST AID PROCEDURES:

**Gold:**
- Ingestion: no data available but one should obtain medical assistance  
- Skin: remove contaminated clothing, flood skin with large amounts of water  
- Eyes: immediately flush eyes, including under eyelids, with large amounts of water for at least 15 minutes. Call a physician  
- Inhalation: no specific information available, one should obtain medical attention
GOLD ZINC ALLOY
MATERIAL SAFETY DATA SHEET

HEALTH HAZARD INFORMATION CONTINUED

EMERGENCY AND FIRST AID PROCEDURES (CONTINUED):

Zinc:
*Ingestion:* no data available but one should obtain medical assistance
*Skin:* remove contaminated clothing, flood skin with large amounts of water, if irritation persists seek medical attention
*Eyes:* immediately flush eyes, including under eyelids, with large amounts of water for at least 15 minutes. Call a physician
*Inhalation:* no specific information available, one should obtain medical attention

REACTIVITY DATA

Gold:
*Incompatibility:* NH3, NH4OH + aqua regia, H2O2, aqua regia with mixtures containing chlorides, bromides or iodides, oxidizing agents especially those containing halogens, alkali cyanides, solutions of thiocyanates and double cyanides.
*Hazardous Decomposition Products:* no data
*Conditions to avoid:* Incompatibilities
*Stability:* Stable
*Hazardous Polymerization:* will not occur
*Other:* can form explosive compounds with NH3, NH4OH + aqua regia, H2O2

Zinc:
*Incompatibility:* Amines, cadmium, chlorinated solvents, sulfur, strong acids, strong bases, fluorine, carbon disulfide, selenium, magnesium, tellurium, chlorates sodium peroxide, moisture, oxidizing agents.
*Hazardous Decomposition Products:* Thermal decomposition may release toxic and/or hazardous gases.
*Conditions to avoid:* Incompatibilities
*Stability:* Stable
*Hazardous Polymerization:* will not occur
*Other:* unknown

ENVIRONMENTAL INFORMATION

RCRA CODE: none

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Wearing full protective equipment, cover spill with dry sand or vermiculite. Mix well & carefully transfer to container.

WASTE DISPOSAL METHOD: Consult federal, state and local regulations for disposal.

PROTECTION INFORMATION

Ventilation Requirements: laboratory fume hood
Respiratory Protection: high efficiency particle respirator
Protective Gloves: rubber
Eye/Face Protection: ANSI approved safety goggles
SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE: Keep container tightly closed. Store in a cool, dry, well-ventilated area. Wash thoroughly after use.

OTHER PRECAUTIONS: Lab coat and apron, flame and chemical resistant coveralls, eyewash capable of sustained flushing, safety drench shower and hygienic facilities for washing.

Per 49CFR 172.101

PROPER SHIPPING NAME: Not regulated

HAZARDOUS CLASSIFICATION: None

UN#: None

COMMENTS

NO TOXIC EFFECTS KNOWN

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