SAFETY DATA SHEET

Effective Date: 05/19/15  Revision Date: 5/30/17  Revision Number: 01

Section 1 - Identification of the Substance/Mixture and of the Company

1.1 Product Identifier:
   Chemical Family: Zinc
   Chemical Product: Zinc Alloy

1.2 Recommended uses and Restrictions on use:
   Recommended Use (Alloys): SHG Zn Slabs, Ball Anodes, Bar Anodes, Zamak #2, #3, #5, #7, #8, #12, & #27, Zn Brighteners. Refer to the Certificate of Analysis with delivered loads for specific elements of the alloy.

   Restrictions on Use: Not for Aquatic use!

1.3 Manufacturer Details:
   Manufacturer's Name: Metropolitan Alloys Corporation, Inc.
   Manufacturer's Address: 17385 Ryan Road
                           Detroit, MI 48212
   Manufacturer's Contact / Email: Henry Szybowicz (hszybowicz@metroalloys.com)
   Emergency Telephone No: (313) 366-4444 Ext 226

Section 2 - Hazard(s) Identification

2.1 Classification of the substance or mixture:
   Classification according to Regulation EC No. 1272/2008 Not classified as dangerous according to the criteria of Regulation (EC) No. 1272/2008
   Classification according to Directive 67/548/EEC- 1999/45/EC Not classified as dangerous according to the criteria of directive(s) 67/548/EEC and/or 1999/45/EC

2.2 Label elements:
   Labeling according to Regulation EC No. 1272/2008 (CLP) Not classified as dangerous according to the criteria of Regulation (EC) No. 1272/2008

2.3 Other Hazards:
   a. Substances does not meet the screening criteria for persistency nor bioaccumulation so it neither PBT nor vPvB.
   b. The melting down of moist metal leads to explosion risk.
   c. Heated product causes burns.
   d. Caution! This substance is subject to exposure limits.
   e. Highly toxic to fishes.
   f. Highly toxic to aquatic plants.
   g. Toxic to bacteria.

Mixtures: a. Not applicable.

Section 3 - Composition/Information on Ingredients

NOTE: Variations in Zinc production account for a wide percentage range of the elements listed below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Symbol</th>
<th>EC#</th>
<th>CAS#</th>
<th>OSHA PEL</th>
<th>TLV</th>
<th>Percent Range (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Al</td>
<td>231-072-3</td>
<td>7429-90-5</td>
<td>15MG/M3</td>
<td>10MG/M3</td>
<td>0 - 28%</td>
</tr>
<tr>
<td>3.2</td>
<td>Cd</td>
<td>231-152-8</td>
<td>7440-43-9</td>
<td>.05MG/M3</td>
<td>.1MG/M3</td>
<td>0 - .015%</td>
</tr>
<tr>
<td>3.3</td>
<td>Cu</td>
<td>231-159-6</td>
<td>7440-50-8</td>
<td>.01MG/M3</td>
<td>.2MG/M3</td>
<td>0 - 11%</td>
</tr>
<tr>
<td>3.4</td>
<td>Fe</td>
<td>231-096-4</td>
<td>7439-89-6</td>
<td>10MG/M3</td>
<td>5MG/M3</td>
<td>0 - .20%</td>
</tr>
<tr>
<td>3.5</td>
<td>Pb</td>
<td>231-100-4</td>
<td>7439-92-1</td>
<td>.05MG/M3</td>
<td>.15MG/M3</td>
<td>0 - .02%</td>
</tr>
<tr>
<td>3.6</td>
<td>Mg</td>
<td>231-104-6</td>
<td>7439-95-4</td>
<td>15MG/M3</td>
<td>10MG/M3</td>
<td>0 - 1%</td>
</tr>
<tr>
<td>3.7</td>
<td>Ni</td>
<td>231-111-4</td>
<td>7440-02-0</td>
<td>1MG/M3</td>
<td>1MG/M3</td>
<td>0 - .2%</td>
</tr>
<tr>
<td>3.8</td>
<td>Si</td>
<td>231-130-8</td>
<td>7440-21-3</td>
<td>10MG/M3</td>
<td>10MG/M3</td>
<td>0 - 1%</td>
</tr>
<tr>
<td>3.9</td>
<td>Sn</td>
<td>231-141-8</td>
<td>7440-31-5</td>
<td>2MG/M3</td>
<td>2MG/M3</td>
<td>0 - .01%</td>
</tr>
<tr>
<td>3.10</td>
<td>Zn</td>
<td>231-175-3</td>
<td>7440-66-6</td>
<td>5MG/M3</td>
<td>10MG/M3</td>
<td>Remainder</td>
</tr>
</tbody>
</table>

May be used to comply with
OSHA's Hazard Communication Standard
Section 4 - First Aid Measures

4.1 Description of First Aid Measures:

4.1.1 After inhalation:
After inhalation of fume: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

4.1.2 After skin contact:
In case of burns: Wash immediately with lots of water (15 minutes)/shower. Remove clothing while washing. Do not tear off solidified product from skin. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

4.1.3 After eye contact:
After contact with fume: Rinse immediately with plenty of water for 15 minutes. Take victim to an ophthalmologist.

4.1.4 After ingestion:
Not applicable.

4.2 Most important symptoms and effects, both acute and delayed:

4.2.1 Acute Symptoms

4.2.1.1 After inhalation:
After inhalation of fume:
- Irritation of the nasal mucous membranes. Dry/sore throat. Coughing.
After inhalation of fume:

4.2.1.2 After skin contact:
If Melting: Burns

4.2.1.3 After eye contact:
If Melting: Burns

4.2.1.4 After ingestion:
No data available.

4.2.2 Delayed Symptoms
No data available

4.2.3 Indication of any immediate medical attention and special treatment needed:
Not applicable.

Section 5 - Fire Fighting Measures

5.1 Extinguishing media:
   Suitable extinguishing media:
   Use Media appropriate for surrounding fire.
   Unsuitable extinguishing media:
   Water (if molten).

5.2 Special hazards arising from the substance or mixture:
   On burning formation of metallic fumes (zinc oxide).
   In molten state: violent to explosive reaction with water (moisture).
   Combustion may produce irritating and toxic gases/fumes.

5.3 Advice for firefighters:
   Instructions:
   Cool fire exposed containers and structures with water (avoid any molten metal with the water).
   Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing for all fires involving chemicals.

<table>
<thead>
<tr>
<th>Special Recommended Protective Equipment for Fire Fighters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EYES/FACE</strong></td>
</tr>
<tr>
<td>Protective Faceshield/Safety Glasses or Mask</td>
</tr>
</tbody>
</table>
Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

   Protective equipment for emergency responders:

<table>
<thead>
<tr>
<th>Recommended Protective Equipment for Emergency Responders</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EYES/FACE</td>
<td>HANDS</td>
<td>RESPIRATORY</td>
</tr>
<tr>
<td>Gloves</td>
<td>Compressed Air/Oxygen Apparatus</td>
<td>Thermal Protective Clothing</td>
</tr>
</tbody>
</table>

6.2 Environmental precautions:

   No data available.

6.3 Methods and material for containment and clean-up:

   If melted: allow liquid to solidify before taking it up. Pick-up the material. Wash clothing and equipment after handling.

Section 7 - Handling and Storage

NOTE: The information in this section is a general description.

7.1 Precautions for safe handling:

   7.1.1 Avoid breathing/raising dust.
   7.1.2 Keep away from naked flame/heat.
   7.1.3 Observe strict hygiene.
   7.1.4 On (re)melting down: dry and preheat installation before use.
   7.1.5 Add only dry material to the metal bath.
   7.1.6 Avoid contact with the eyes, skin and clothing.
   7.1.7 Use with adequate ventilation.
   7.1.8 Wash thoroughly after handling.
   7.1.9 Keep containers closed when not in use.
   7.1.10 Empty containers retain product residues and can be hazardous. Follow all SDS precautions when handling empty containers.

7.2 Conditions for safe storage, including any incompatibilities:

   7.2.1 Safe storage requirements:
   7.2.1.1 Keep away from: 
   (Strong) acids.
   7.2.1.2 Suitable packaging material:
   No Data Available.
   7.2.1.3 Non suitable packaging material:
   No Data Available

Section 8 - Exposure Control/Personal Protection

8.1 Control Parameters:

   8.1.1 Occupational Exposure Limits:
<table>
<thead>
<tr>
<th>Substance</th>
<th>Country</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Oxide</td>
<td>United States</td>
<td>2 mg/,2 TWA ACGIH TLV (Respirable), 10 mg/m3 STEL (Respirable), 5 mg/m3 TWA OSHA PEL (Respirable), 15 mg/m3 TWA OSHA PEL (Total Dust)</td>
</tr>
<tr>
<td></td>
<td>Germany</td>
<td>0.1 mg/m3 TWA DFG MAK (Respirable), 2 mg/m3 TWA (Inhalable)</td>
</tr>
</tbody>
</table>
Section 8 - Exposure Control/Personal Protection (Continued)

<table>
<thead>
<tr>
<th>Country</th>
<th>Biological Exposure Limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>None Established</td>
</tr>
<tr>
<td>European Union</td>
<td>None Established</td>
</tr>
<tr>
<td>Asia</td>
<td>None Established</td>
</tr>
<tr>
<td>European Union</td>
<td>None Established</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>None Established</td>
</tr>
<tr>
<td>France</td>
<td>None Established</td>
</tr>
<tr>
<td>Spain</td>
<td>None Established</td>
</tr>
<tr>
<td>Italy</td>
<td>None Established</td>
</tr>
</tbody>
</table>

8.1.2 Biological Exposure Limits:
None Established.

8.2 Exposure Controls:

8.2.1 Appropriate Engineering Controls:
Use with adequate general or local exhaust ventilation to maintain exposure levels below the occupational exposure limits.

8.3 Individual Protective Measures (PPE):

8.3.1 Specific Eye/Face Protection:
Chemical safety goggles recommended

8.3.2 Specific Hand Protection:
Wear gloves for recommended protection from heat and sharp edges.

8.3.3 Specific Respiratory Protection:
None required under normal use conditions.

8.3.4 Specific Skin/Body Protection:
When handling molten/extreme hot Zinc

<table>
<thead>
<tr>
<th>EYES/FACE</th>
<th>HANDS</th>
<th>RESPIRATORY</th>
<th>SKIN/BODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective Faceshields/Safety</td>
<td>Gloves</td>
<td>Thermal Protective Clothing</td>
<td></td>
</tr>
<tr>
<td>Glasses or Mask</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section 9 - Physical & Chemical Properties

9.1 Physical Properties:

9.1.1 Physical Form:
Solid

9.1.2 Boiling Point:
Approx. 1665°F

9.1.3 Melting Point:
Approx. 728°F

9.1.4 Vapor Pressure (mm Hg.):
N/A

9.1.5 Vapor Density (AIR=1):
N/A

9.1.6 Evaporation Rate:
N/A

9.1.7 Specific Gravity:
Range 5.0 - 6.7

9.1.8 Density:
N/A

9.1.9 Water Solubility:
None

9.1.10 pH:
N/A

9.1.11 Color:
Silver to Bluish Silver

9.1.12 Odor:
No Odor

9.2 Physical hazards:
No physical hazard class.

9.3 Other information:
No data available.

Section 10 - Stability & Reactivity

10.1 Reactivity:
No unusual reactivity.

10.2 Chemical stability:
Stable under normal conditions.
Section 13 - Disposal Considerations

13.1 Waste treatment methods:
Material, dross, and baghouse dust sold as product, no waste streams.

13.2 Disposal methods:
No disposal required, all is product for sale.

13.3 Packaging/Container
No Data Available

Section 14 - Transportation Information

<table>
<thead>
<tr>
<th>14.1 UN Number</th>
<th>14.2 UN Proper Shipping Name</th>
<th>14.3 Hazard Class(s)</th>
<th>14.4 Packing Group</th>
<th>14.5 Environmental Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>No</td>
</tr>
</tbody>
</table>
### Section 14 - Transportation Information (Continued)

<table>
<thead>
<tr>
<th>14.1 UN Number</th>
<th>14.2 UN Proper Shipping Name</th>
<th>14.3 Hazard Class(s)</th>
<th>14.4 Packing Group</th>
<th>14.5 Environmental Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR/RID</td>
<td>UN3077</td>
<td>Environmentally Hazardous Substance, solid n.o.s. (zinc oxide)</td>
<td>9</td>
<td>PG III</td>
</tr>
<tr>
<td>IMDG</td>
<td>UN3077</td>
<td>Environmentally Hazardous Substance, solid n.o.s. (zinc oxide)</td>
<td>9</td>
<td>PG III</td>
</tr>
<tr>
<td>IATA/ICAO</td>
<td>UN3077</td>
<td>Environmentally Hazardous Substance, solid n.o.s. (zinc oxide)</td>
<td>9</td>
<td>PG III</td>
</tr>
</tbody>
</table>

### Section 15 - Regulatory information

#### 15.1 OSHA/MOSHA
**U.S. Federal Regulations (OSHA)/Michigan State Regulations (MOSHA):** This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard (29 CFR 1910.1200)

#### 15.2 EPA/MDEQ
**U.S. Federal Regulations (E.P.A.)/Michigan Department of Environmental Quality (MDEQ):**

- **S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370):** This product does NOT contain any chemical subject to the reporting requirements of this standard.
- **S.A.R.A. Title III Section 313 (40 CFR 372):** This product does NOT contain any chemical subject to the reporting requirements of this standard.
- **302 (EHS) TPQ (40 CFR 355):** Not applicable.

#### 15.3 TSCA
**TSCA CAS Number:** Not applicable.

### Section 16 - Other information

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