Mueller Brass Co.
Safety Data Sheet
EcoStream™ Low Lead Brass Alloys (C36300, C36500, C37000, 37100)

Section 1 – Product / Supplier Information

Product Name
EcoStream™ Low Lead Brass Alloys (C36300, C36500, C37000)

Manufacturer Information
Mueller Brass Co.
2199 Lapeer Avenue
Port Huron, MI 48060

Phone: 810-987-7770
Emergency Telephone: CHEMTREC 800-424-9300

Section 2 – Hazard Identification

General Hazard Statement: Solid metallic products are generally classified as “articles” and do not constitute a hazardous materials in solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Any articles manufactured from these solid products would be generally classified as non-hazardous. However some hazardous elements contained in these products can be emitted under certain processing conditions such as but not limited to: burning, melting, cutting, sawing, brazing, grinding, machining, milling, and welding. The following classification information is for the hazardous elements which may be released during certain processing.

GHS Classification:
- Respiratory Sensitizer - Category 1B
- Germ Cell Mutagenicity - Category 2
- Carcinogenicity - Category 2
- Toxic to reproduction - Category 1A
- Specific target organ toxicity - Repeated exposure - Category 1 (respiratory system)
- Hazardous to aquatic environment - Acute Hazard - Category 1
- Hazardous to aquatic environment - Chronic Hazard - Category 1

GHS LABEL ELEMENTS
Symbol(s)

Signal Word
Danger

Hazard Statements
- Causes eye irritation
- May cause allergy or asthma symptoms or breathing difficulties if inhaled
- May cause an allergic skin reaction
- Suspected of causing genetic defects
- Suspected of causing cancer
- Causes damage to organs (kidneys, respiratory system)
- Causes damage to organs through prolonged or repeated exposure (respiratory system)
- Very toxic to aquatic life
- Very toxic to aquatic life with long lasting effects
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Precautionary Statements

Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
In case of inadequate ventilation wear respiratory protection
Contaminated work clothing should not be allowed out of the workplace.
Wash hands thoroughly after handling
Wear protective gloves
Use personal protective equipment as required
Do not eat, drink or smoke when using this product.
Avoid release to the environment

Storage
Store locked up

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 3 – Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-50-8</td>
<td>Copper</td>
<td>58 – 63</td>
</tr>
<tr>
<td>7440-66-6</td>
<td>Zinc</td>
<td>35.5 – 41.8</td>
</tr>
<tr>
<td>7439-92-1</td>
<td>Lead</td>
<td>0.3 – 1.5</td>
</tr>
</tbody>
</table>

The above listing is a summary of elements used in alloying brass. Various grades will contain different combinations of these elements. Other trace elements may also be present in minute amounts. These small quantities (less than 0.1%) are frequently referred to as “trace” or “residual” elements; generally they originate in the raw material used. Such elements would include nitrogen (N), oil mist (mineral1), oxygen (O), and silver (Ag). Various byproducts of processing from these trace elements may include nitric oxide, nitrogen dioxide, and ozone, and these byproducts may also be considered trace. If listed in the above table, the ingredient is considered to be a component rather than trace.

Footnotes:
1. The bar/piece may have a light coating of oil to prevent corrosion.

Section 4 – First Aid Measures

The following information is for the hazardous elements which may be released during certain processing (See Section 2)

Eyes
Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Consult a physician.

Skin
Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.

Ingestion
Do NOT induce vomiting. Call a physician or Poison Control Center immediately. Drink plenty of water. Never give anything by mouth to an unconscious person.

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult a physician.
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Section 5 – Firefighting Measures
The following information is for the hazardous elements which may be released during certain processing (See Section 2)

General Fire Hazards
See Section 9 for Flammability Properties. This product does not present fire or explosion hazards as shipped. Small chips, fines, and dust from processing may be readily ignitable.

Hazardous Combustion Products
Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do NOT breathe fumes. May cause sensitization by inhalation and skin contact.

Extinguishing Media
Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and fines.

Unsuitable Extinguishing Media
DO NOT use halogenated extinguishing agents on small chips or fines. DO NOT use water for fires involving molten metal. These fire extinguishing agents will react with burning material.

Fire Fighting Equipment/Instructions
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6 – Accidental Release Measures
The following information is for the hazardous elements which may be released during processing.

Recovery and Neutralization
Avoid dust formation. Collect scrap for recycling.

Materials and Methods for Clean-Up
If product is molten, contain the flow using dry sand or salt flux as a dam. All tools and containers which come in contact with molten metal must be preheated or specially coated and rust free. Allow the spill to cool before remelting as scrap.

Personal Precautions and Protective Equipment
Wear appropriate protective clothing and respiratory protection for the situation.

Environmental Precautions
Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

Prevention of Secondary Hazards
None

Section 7 – Handling and Storage
The following information is for the hazardous elements which may be released during certain processing (See Section 2)

Handling Procedures
Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Avoid dust formation. Keep material dry. Avoid contact with sharp edges or heated material.

Storage Procedures
Keep container tightly closed in a dry and well-ventilated place.
Incompatibilities
See Section 10

Section 8 – Exposure Controls/Personal Protection
The following information is for the hazardous elements which may be released during certain processing (See Section 2)

Component Exposure Limits
Copper (7440-50-8)
ACGIH: 0.2 mg/m³ TWA (fume)
OSHA: 1.0 mg/m³ TWA (dust, mist, as Cu) 0.1 mg/m³ TWA (fume)
NIOSH: 1 mg/m³ TWA (dust and mist); 0.1 mg/m³ TWA (fume)

Lead (7439-92-1)
ACGIH: 0.05 mg/m³ TWA
OSHA: 30 µg/m³ Action Level (Poison, See 29 CFR 1910.1025); 50 µg/m³ TWA
NIOSH: 0.050 mg/m³ TWA

Engineering Measures
Where feasible, enclose processes to prevent dust dispersion into the work area. Provide local exhaust when possible, and general ventilation as necessary, to keep airborne concentrations below exposure limits and as low as possible.

Personal Protective Equipment

Respiratory
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Hands
Use impervious gloves such as neoprene, nitrile, or rubber for hand protection.

Eyes
Wear safety glasses with side shields and/or goggles as necessary to prevent dust from entering eyes.

Skin and Body
Use body protection appropriate for task.

Hygiene Measures
Do not breathe vapors/dust. When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs.

Section 9 – Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Yellow-Brown Metal</td>
</tr>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>ND</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>ND</td>
</tr>
<tr>
<td>Solubility (H2O)</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>ND</td>
</tr>
<tr>
<td>Octanol/H2O Coeff.</td>
<td>ND</td>
</tr>
<tr>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>pH</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>ND</td>
</tr>
<tr>
<td>Melting Point</td>
<td>866-1038 (°C) / 1590-1900 (°F)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>ND</td>
</tr>
<tr>
<td>VOC</td>
<td>ND</td>
</tr>
<tr>
<td>Flash Point</td>
<td>NA</td>
</tr>
</tbody>
</table>
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**Section 10 – Stability and Reactivity**

The following information is for the hazardous elements which may be released during certain processing (See Section 2)

### Chemical Stability
Stable under recommended storage conditions.

### Hazardous Reaction Potential
Will not occur.

### Conditions to Avoid
Dust formation. Heat, flames and sparks. Protect from water.

### Incompatible Products

### Hazardous Decomposition Products
Toxic metal oxides and carbon and nitrogen oxides may be produced during a fire involving metal alloys.

**Section 11 – Toxicological Information**

The following information is for the hazardous elements which may be released during certain processing (See Section 2)

### Acute Toxicity
**Component Analysis - LD50/LC50**

NA

### Skin
Contact with dust can cause mechanical irritation or drying of the skin. Contact with oils from processing may cause irritation. Prolonged skin contact may defat the skin and produce dermatitis. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

### Eye
Dust contact with the eyes can lead to mechanical irritation.

### Ingestion
May be harmful if swallowed. May cause additional affects as listed under "Inhalation".

### Inhalation
May be harmful if inhaled. Inhalation of dust in high concentration may cause irritation of respiratory system.

### Respiratory Organs Sensitization/Skin Sensitization
May cause an allergic skin reaction

### Generative Cell Mutagenicity
Suspected of causing genetic defects
Carcinogenicity

A: General Product Information
Suspected of causing cancer.

B: Component Carcinogenicity

Lead (7439-92-1)
ACGH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
OSHA: 30 µg/m³ Action Level (Poison, See 29 CFR 1910.1025); 50 µg/m³ TWA
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 87 [2006] (evaluates inorganic lead compounds as Group 2A and organic lead compounds as Group 3) (Group 2A (probably carcinogenic to humans))

Reproductive Toxicity

Lead may damage the reproductive system and cause developmental damage.

Specified Target Organ General Toxicity: Single Exposure
Causes damage to organs (kidneys, respiratory system)

Specified Target Organ General Toxicity: Repeated Exposure
May cause damage to organs through prolonged or repeated exposure (respiratory system). Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.

Elevated temperature processing such as welding and plasma arc cutting may release hazardous fumes. Overexposure to metal fumes may cause pulmonary edema (fluid in the lungs) and methemoglobinemia. May also cause pulmonary fibrosis and lung cancer. Lead compounds may be absorbed by ingestion, by inhalation and through the skin. Lead may damage kidney function, the blood forming system and the reproductive system. Inorganic lead compounds can cause developmental damage.

Aspiration Respiratory Organs Hazard

Section 12 – Ecological Information
The following information is for the hazardous elements which may be released during certain processing (See Section 2)

Ecotoxicity

A: General Product Information
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Copper (7440-50-8)

<table>
<thead>
<tr>
<th>Test &amp; Species</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>96 Hr LC50 Pimephales promelas</td>
<td>0.0068 - 0.0156 mg/L</td>
</tr>
<tr>
<td>96 Hr LC50 Pimephales promelas</td>
<td>&lt;0.3 mg/L [static]</td>
</tr>
<tr>
<td>96 Hr LC50 Pimephales promelas</td>
<td>0.2 mg/L [flow-through]</td>
</tr>
<tr>
<td>96 Hr LC50 Oncorhynchus mykiss</td>
<td>0.052 mg/L [flow-through]</td>
</tr>
<tr>
<td>96 Hr LC50 Lepomis macrochirus</td>
<td>1.25 mg/L [static]</td>
</tr>
<tr>
<td>96 Hr LC50 Cyprinus carpio</td>
<td>0.3 mg/L [semi-static]</td>
</tr>
<tr>
<td>96 Hr LC50 Cyprinus carpio</td>
<td>0.8 mg/L [static]</td>
</tr>
<tr>
<td>96 Hr LC50 Poecilia reticulata</td>
<td>0.112 mg/L [flow-through]</td>
</tr>
<tr>
<td>72 Hr EC50 Pseudokirchneriella subcapitata</td>
<td>0.0426 - 0.0535 mg/L [static]</td>
</tr>
<tr>
<td>96 Hr EC50 Pseudokirchneriella subcapitata</td>
<td>0.031 - 0.054 mg/L [static]</td>
</tr>
</tbody>
</table>
### Test & Species

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Test &amp; Species</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.16-3.05 mg/L</td>
<td>96 Hr LC50 Pimephales promelas</td>
<td>[flow-through]</td>
</tr>
<tr>
<td>0.211-0.269 mg/L</td>
<td>96 Hr LC50 Pimephales promelas</td>
<td>[semi-static]</td>
</tr>
<tr>
<td>2.66 mg/L [static]</td>
<td>96 Hr LC50 Pimephales promelas</td>
<td>[static]</td>
</tr>
<tr>
<td>30 mg/L</td>
<td>96 Hr LC50 Cyprinus carpio</td>
<td>[flow-through]</td>
</tr>
<tr>
<td>0.45 mg/L</td>
<td>96 Hr LC50 Cyprinus carpio</td>
<td>[semi-static]</td>
</tr>
<tr>
<td>7.8 mg/L [static]</td>
<td>96 Hr LC50 Cyprinus carpio</td>
<td>[static]</td>
</tr>
<tr>
<td>3.5 mg/L [static]</td>
<td>96 Hr LC50 Lepomis macrochirus</td>
<td>[static]</td>
</tr>
<tr>
<td>0.24 mg/L</td>
<td>96 Hr LC50 Oncorhynchus mykiss</td>
<td>[flow-through]</td>
</tr>
<tr>
<td>0.59 mg/L</td>
<td>96 Hr LC50 Oncorhynchus mykiss</td>
<td>[semi-static]</td>
</tr>
<tr>
<td>0.41 mg/L [static]</td>
<td>96 Hr LC50 Oncorhynchus mykiss</td>
<td>[static]</td>
</tr>
<tr>
<td>0.11 - 0.271 mg/L</td>
<td>96 Hr EC50</td>
<td>[static]</td>
</tr>
<tr>
<td>0.09 - 0.125 mg/L</td>
<td>Pseudokirchneriella subcapitata</td>
<td>[static]</td>
</tr>
<tr>
<td>0.139 - 0.908 mg/L</td>
<td>48 Hr EC50 Daphnia magna</td>
<td>[Static]</td>
</tr>
</tbody>
</table>

### Lead (7439-92-1)

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Test &amp; Species</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.44 mg/L</td>
<td>96 Hr LC50 Cyprinus carpio</td>
<td>[semi- static]</td>
</tr>
<tr>
<td>1.17 mg/L</td>
<td>96 Hr LC50 Oncorhynchus mykiss</td>
<td>[flow- through]</td>
</tr>
<tr>
<td>1.32 mg/L [static]</td>
<td>96 Hr LC50 Oncorhynchus mykiss</td>
<td>[static]</td>
</tr>
<tr>
<td>600 µg/L</td>
<td>48 Hr EC50 water flea</td>
<td>[Static]</td>
</tr>
</tbody>
</table>

### Persistence/Degradability
Metal powders may cause ecological damage through silting or sedimentation effect in water depriving organisms of habitat and mobility, and/or fouling of gills, lungs and skin thus limiting oxygen uptake.

### Bioaccumulation
Metal powders in water or soil may form metal oxides or other metal compounds that could become bioavailable and harm aquatic or terrestrial organisms.

### Mobility in Soil
Metal powder would be relatively immobile in soils but some metal compounds may be transported with ground water.

### Section 13 – Disposal Considerations

The following information is for the hazardous elements which may be released during certain processing (See Section 2)

### Waste Disposal Instructions

See Section 7 for Handling Procedures.
See Section 8 for Personal Protective Equipment recommendations.
Disposal of Contaminated Containers or Packaging
Dispose of in accordance with federal, state and local regulations

Section 14 – Transport Information
The following information is for the hazardous elements which may be released during certain processing (See Section 2)

Component Marine Pollutants
This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>DOT regulated severe marine pollutant (powder)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td></td>
</tr>
</tbody>
</table>

DOT Information
Shipping Name: Not Regulated

IATA Information
Shipping Name: Not Regulated

ICAO Information
Shipping Name: Not Regulated

IMDG Information
Shipping Name: Not Regulated

Section 15 – Regulatory Information

Regulatory Information

A: Component Analysis
This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Copper (7440-50-8)
SARA 313: 1.0 % de minimis concentration
CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 μm);

Zinc (7440-66-6)
SARA 313: 1.0 % de minimis concentration (dust or fume only)
CERCLA: 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 μm)

Lead (7439-92-1)
SARA 313: 0.1 % Supplier notification limit; 0.1 % de minimis concentration (when contained in stainless steel, brass, or bronze)
CERCLA: 10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 μm);

B: Component Marine Pollutants
This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.
Copper (7440-50-8)  
55-96  DOT regulated severe marine pollutant (powder)

State Regulations

A: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
<th>RI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

PROPOSITION 65 - WARNING! This product contains a chemical known to the state of California to cause cancer, birth defects or other reproductive harm.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Minimum Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>1 %</td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>0.1 %</td>
</tr>
</tbody>
</table>

Additional Regulatory Information

Component Analysis - Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>TSCA</th>
<th>CAN</th>
<th>EEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>Yes</td>
<td>DSL</td>
<td>EINECS</td>
</tr>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>Yes</td>
<td>DSL</td>
<td>EINECS</td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>Yes</td>
<td>DSL</td>
<td>EINECS</td>
</tr>
</tbody>
</table>

Section 16 - Other Information

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; EU = European Union; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; NDSL = Non-Domestic Substances List; NTP = National Toxicology Program; TLV = Threshold Limit Value; TWA = Time Weighted Average; NIOSH = National Institute of Occupational Safety and Health; OSHA = Occupational Safety and Health Administration; IMDG = International Maritime Dangerous Goods Code; IATA = International Air Transport Association

Literature References

None

Prepared: Prepared 18 February 2015