BERNZOMATIC LEAD FREE SILVER BEARING SOLDER -
TIN/COPPER/SILVER ACID CORE SOLDER ALLOYS (TCI-107-1)

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Bernzomatic Lead Free Silver Bearing Solder - Tin/Copper/Silver Acid Core Solder Alloys (TCI-107-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Code</td>
<td>-</td>
</tr>
<tr>
<td>Other Names</td>
<td>-</td>
</tr>
<tr>
<td>Product Use</td>
<td>Soldering applications</td>
</tr>
<tr>
<td>Company Name</td>
<td>Bromic Group</td>
</tr>
<tr>
<td>Address</td>
<td>1 Sutter Street Silverwater NSW 2128</td>
</tr>
<tr>
<td>Telephone Number</td>
<td>02 9748 3900</td>
</tr>
<tr>
<td>Emergency Telephone</td>
<td>1300 276 642</td>
</tr>
</tbody>
</table>

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
This product consists of silver to silver grey metal wire which contains core of white powder. There is no immediate health hazard associated with the wire product and it is not reactive under normal circumstances of use. Though the wire is not flammable, if involved in a fire and exposed to extremely high temperatures, harmful fumes of metal oxides may be generated. During soldering operations, the most significant routes of exposure are inhalation, and contact of the skin and eyes. Molten solder can cause thermal burns. Prolonged or repeated exposure to tin fumes can result in benign pneumoconiosis, which causes inflammation of the lungs, but there is no distinct fibrosis or evidence of disability.

POTENTIAL HEALTH EFFECTS INFORMATION
Inhalation: The fumes generated during soldering operations may cause respiratory irritation.
Ingestion: Ingestion is not expected to occur in normal use.
Eye Contact: Contact with the wire form of this product can be physically damaging to the eye. Contact with the molten core solder will cause burn to the eyes. Fumes generated during soldering operations can be irritating to the eyes.
Skin Contact: Contact of the wire form of this product with skin is not anticipated to be irritating. Contact with the molten core solder will burn contaminated skin. Fumes generated during soldering operations can be irritating to the skin.

HAZARDOUS SUBSTANCE. NON DANGEROUS GOODS.
Classified as hazardous according to the criteria of Safe Work Australia.

Hazard  
Xi - Irritant

Risk Phrases  
R36/37/38 - Irritating to eyes, respiratory system and skin.

Safety Phrases  
S2 - Keep out of reach of children.
S23 - Do not breathe fumes/vapour.
S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.
3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient (common name)</th>
<th>CAS Number</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tin</td>
<td>7440-31-5</td>
<td>97%</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>3-4%</td>
</tr>
<tr>
<td>Silver</td>
<td>7440-22-4</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Urea</td>
<td>57-13-6</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Inhalation
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical attention.

Ingestion
Give water to drink. Induce vomiting only to a conscious, non-convulsing individual. Never give anything by mouth to an unconscious person. Seek immediate medical attention.

Skin
In case of skin contact, wash affected areas with water and soap. In case of skin contact with molten solder, immediately flush with cold running water for at least 15 minutes. Seek medical attention if symptoms develop.

Eyes
In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if symptoms develop.

5. FIRE FIGHTING MEASURES

For major fires call the Fire Brigade. Ensure that an escape path is available from any fire.

Suitable Extinguishing Media
Water spray, dry chemical, carbon dioxide or foam.

Hazardous Combustion Products
Metal oxide fumes may be evolved at temperatures above 250°C (melting point).

Special Protective Actions for Firefighters
Evacuate all unnecessary personnel from the area. Allow only properly trained and protected emergency response personnel in area. If involved in a fire, use a Safe Work Australia approved self-contained breathing apparatus and full protective equipment.

Unusual Fire or Explosion Hazards
The solid metal form is not a fire hazard. However, dust generated from processing operations may present a moderate fire or explosion hazard. Accidental contaminants to a product such as moisture, ice, snow, grease or oil can cause an explosion when charged to a molten bath or melting furnace (preheating metal will remove moisture from product).

Hazchem Code
Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions,
Minimum personal protective equipment should be gloves and
### Protective Equipment and Emergency Procedures
- goggles, as well as appropriate body protection. If dust/fume exposure exist respiratory protection should be worn. Evacuate all non-essential personnel from affected area. Do not breathe fumes and vapour. Ventilate contaminated area thoroughly.

### Environmental Precautions
- In the event of a major spill, prevent spillage from entering drains or water courses.

### Methods and Materials for Containment and Cleaning Up
- Material in dust form clean up using dustless methods (HEPA vacuum). Do not use compressed air. If the material is molten, allow it to cool and solidify, then scrap-up the product. Decontaminate the area thoroughly. Place all spilled residues in a suitable container for consequent disposal.

### 7. HANDLING AND STORAGE

#### Precautions for Safe Handling
- Use of safe work practices are recommended to avoid eye or skin contact and inhalation of fumes during soldering operations. Use only with adequate ventilation.
- Food, beverages and tobacco products should not be stored or consumed where this material is in use. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.
- Provide eyewash fountains and safety showers in close proximity to points of potential exposure.

#### Conditions for Safe Storage
- Store in a dry, well ventilated area. Keep material dry. Prevent dust accumulation. Keep away from incompatible materials.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Control Parameters - Exposure Standards (Safe Work Australia)
- **Tin (metal):**
  - TWA: - ppm / 2 mg/m³
  - STEL: - ppm / - mg/m³
- **Tin, organic compounds (as Sn):**
  - TWA: - ppm / 0.1 mg/m³
  - STEL: - ppm / 0.2 mg/m³
- **Copper (fume):**
  - TWA: - ppm / 0.2 mg/m³
  - STEL: - ppm / - mg/m³
- **Copper, dusts & mists (as Cu):**
  - TWA: - ppm / 1 mg/m³
  - STEL: - ppm / - mg/m³
- **Silver (metal):**
  - TWA: - ppm / 0.1 mg/m³
  - STEL: - ppm / - mg/m³

#### Engineering Controls
- Adequate mechanical ventilation to control airborne concentrations below the exposure guidelines/limits.

#### Personal Protective Equipment (PPE)
- Respiratory Protection
  - If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, use a Safe Work Australia approved respiratory protection (weld fume...
respirator or air line respirator). Respiratory protection is recommended to be worn during welding operations. See Australian Standards AS/NZS 1715 and 1716 for more information.

**Eye/Face Protection**

Safety glasses with top and side shields or goggles. See Australian Standards AS 1336 and AS/NZS 1337 for more information. Contact lenses should not be worn when working with this chemical.

**Skin Protection**

Wear gloves that protect from sparks and flame and protective clothing. See Australian Standards AS 2161 and 2919 and AS/NZS 2210 for more information.

**Thermal Hazards**

The molten material can present a significant thermal hazard. Wear safety glasses with top and side shields or goggles and protective equipment. Keep melting/soldering temperatures as low as possible to minimize generation of fumes.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Solid – Silver to silver grey metal. Contains core of white powder.</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Odour Threshold</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Melting Point / Freezing Point</strong></td>
<td>227-250°C</td>
</tr>
<tr>
<td><strong>Initial Boiling Point / Range</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Flash Point</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Flammability</strong></td>
<td>Not flammable</td>
</tr>
<tr>
<td><strong>Lower Flammability or Explosive Limit</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Upper Flammability or Explosive Limit</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Vapour Pressure</strong></td>
<td>Not volatile</td>
</tr>
<tr>
<td><strong>Vapour Density</strong></td>
<td>Not volatile</td>
</tr>
<tr>
<td><strong>Relative Density (Specific Gravity)</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Solubility in Water</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Auto-ignition Temperature</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Decomposition Temperature</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Percent Volatile by Weight</strong></td>
<td>Not volatile</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical Stability</strong></td>
<td>Stable at ambient temperature and under normal conditions of use</td>
</tr>
<tr>
<td><strong>Hazardous Polymerization</strong></td>
<td>Will not occur.</td>
</tr>
<tr>
<td><strong>Conditions to Avoid</strong></td>
<td>No information available.</td>
</tr>
<tr>
<td><strong>Incompatible Materials</strong></td>
<td>Chlorine, turpentine, magnesium and acetylene gas.</td>
</tr>
</tbody>
</table>
Hazardous Decomposition Products
Metal oxide fumes may be evolved at temperatures above 250°C (melting point).

### 11. TOXICOLOGICAL INFORMATION

#### Toxicity

**Tin:**
Acute, short term exposure to tin fumes can cause irritation of the eyes, skin, mucous membranes and respiratory system. Prolonged or repeated exposure to tin can result in benign pneumoconiosis (stannosis), which causes inflammation of the lungs, but there is no distinct fibrosis or evidence of disability.

**Copper:**
Oral TDLo (human) = 120 µg/m³ – gastrointestinal tract effects
Acute, short term exposure to copper fumes can cause irritation of the eyes, skin, mucous membranes and respiratory system. Severe fume exposure may cause metal fume fever with flu-like symptoms such as sweet metal taste, dry throat, coughing, fever, tightness in chest, blurred vision, back pain, nausea, vomiting and fatigue. Symptoms usually disappear in 24 hours. Copper may cause skin and hair discolouration.

**Silver:**
Inhalation TCLo (human) = 1mg/m³
Chronic skin contact or ingestion of dusts, salts, or fumes of silver can result in a condition known as argyria. This condition is marked by a bluish appearance of the skin and eyes.

#### Acute Health Effects

<table>
<thead>
<tr>
<th>Skin Corrosion/Irritation</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious Eye Damage/Irritation</td>
<td>Yes</td>
</tr>
<tr>
<td>Sensitization</td>
<td>No information available.</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>No information available.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>This product does NOT contain any IARC listed chemicals.</td>
</tr>
<tr>
<td>Reproductive Toxicity</td>
<td>No information available.</td>
</tr>
<tr>
<td>STOT-Single Exposure</td>
<td>No information available.</td>
</tr>
<tr>
<td>STOT-Repeated Exposure</td>
<td>No information available.</td>
</tr>
</tbody>
</table>

#### Aspiration Hazard

| Inhalation: | The fumes generated during soldering operations may cause respiratory irritation. |
| Ingestion: | Ingestion is not expected to occur in normal use. |
| Eye: | Contact with the wire form of this product can be physically damaging to the eye. Contact with the molten core solder will cause burn to the eyes. Fumes generated during soldering operations can be irritating to the eyes. |
| Skin: | Contact of the wire form of this product with skin is not anticipated to be irritating. Contact with the molten core solder will burn contaminated skin. Fumes generated during soldering operations can be irritating to the skin. |

#### Chronic Health Effects

Prolonged or repeated exposure to tin fumes can result in benign
pneumoconiosis, which causes inflammation of the lungs, but there is no distinct fibrosis or evidence of disability.

Existing Conditions
Aggravated by Wilson’s disease.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Silver: 0.1 ppm is toxic to bacteria and aquatic life. Discharge into marine waters should not exceed 1/20 of 96 hour LC₅₀, 0.25-0.025 mg/kg/day.

Bioaccumulation, Persistence and Degradability
Silver: Insoluble in water. Many silver salts are only slightly soluble. The biological half-life for silver is a few days for animals and up to 50 days for humans.
Tin: Insoluble in water.

13. DISPOSAL CONSIDERATIONS

Disposal methods and containers
Dispose according to applicable local and state government regulations.

Special precautions for landfill or incineration
Please consult your state Land Waste Management Authority for more information.

14. TRANSPORT INFORMATION

Not classified as a dangerous good according to the Australian Code for the Transport of Dangerous goods by road or rail.

UN Number Not applicable
Proper Shipping Name Not applicable
Dangerous Goods Class Not applicable
Subsidiary Risk Not applicable
Hazchem Code Not applicable
Packing Group Not applicable
Special Provisions Not applicable
Limited Quantities Not applicable
Packagings & IBCs - Packing Instruction Not applicable
Packagings & IBCs - Special Packing Provisions Not applicable
Portable Tanks & Bulk Containers – Instructions Not applicable
Portable Tanks & Bulk Containers – Special Provisions Not applicable

SEA TRANSPORT – IMDG
UN Number Not applicable
Proper Shipping Name Not applicable
Dangerous Goods Class Not applicable
Packing Group Not applicable

AIR TRANSPORT – ICAO / IATA
SAFETY DATA SHEET

15. REGULATORY INFORMATION

Tin, copper, silver and urea are listed in the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Last Revision of MSDS          Rev 1.0 (14/02/2012)
Prepared by                  MSDS.COM.AU Pty Ltd
Abbreviations Used:
IARC: International Agency for Research on Cancer
ASCC: National Occupational Health and Safety Commission
NTP: National Toxicology Program (U.S.)
OSHA: Occupational Safety and Health Administration (U.S.)
STEL: Short term exposure limit
TWA: Time weighted average

Emergency Contacts

Bromic Group                  02 9748 3900
Bromic Group – Emergency Number 1300 276 642
Police and Fire Brigade       000
Poisons Information Centre   13 11 26

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Please read instructions / label before using product.

This MSDS is prepared in accord with the Safe Work Australia document “National Code of Practice for the Preparation of Material Safety Data Sheets” 2nd Edition [NOHSC:2011(2003)]