1.0 PRODUCT AND COMPANY IDENTIFICATION

PMX Industries, Inc.
5300 Willow Creek Drive SW
Cedar Rapids, Iowa 52404-4303

Emergency: 319-368-7700

TELEPHONE: 319-368-7700
FAX: 319-368-7701

PRODUCT NAMES: PMX

<table>
<thead>
<tr>
<th>ALLOY #</th>
<th>COMMON NAME</th>
<th>UNS #/CDA #</th>
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</thead>
<tbody>
<tr>
<td>101</td>
<td>Oxygen Free Electronic OFHC</td>
<td>C10100</td>
</tr>
<tr>
<td>102</td>
<td>Oxygen Free Copper OFHC</td>
<td>C10200</td>
</tr>
<tr>
<td>103</td>
<td></td>
<td>C10300</td>
</tr>
<tr>
<td>104</td>
<td></td>
<td>C10400</td>
</tr>
<tr>
<td>110</td>
<td>ETP Copper Electrolytic Tough Pitch</td>
<td>C11000</td>
</tr>
<tr>
<td>122</td>
<td>Deoxidized Copper (DHP) Phos Deoxidized Copper</td>
<td>C12200</td>
</tr>
<tr>
<td>151</td>
<td>PMX High Precision Alloy</td>
<td>C15100</td>
</tr>
<tr>
<td>XP5</td>
<td>PMX High Precision Alloy</td>
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</table>

CHEMICAL FAMILY: Copper Alloy

ISSUE DATE: December 15, 2004
SUPERSEDES DATE: March 8, 2004

2.0 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
Copper alloy products in the natural state do not present a hazard for emergency response personnel.

POTENTIAL HEALTH EFFECTS:
Copper alloy products in the natural state do not present an inhalation, ingestion, or contact hazard. However, operations such as burning, welding, sawing, brazing, or grinding may release fumes and/or dusts which may present health hazards if occupational exposure limits are exceeded.
LIKELY ROUTES OF EXPOSURE: Inhalation, Eye Contact, Skin Contact

INHALATION: Short-term exposure to fumes/dust may produce irritation of the respiratory system. High concentrations of copper oxide fumes may cause metal fume fever.

EYE: Short-term exposure to fumes/dust may produce irritation.

SKIN: Repeated or prolonged exposure to copper dusts or mists may cause irritant or allergic contact dermatitis.

INGESTION: Abdominal pain, nausea, vomiting.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Exposure to fumes or dust may aggravate existing respiratory disease or dermatitis.

TARGET ORGANS: Upper respiratory tract, eyes, skin

SIGNS AND SYMPTOMS:
Metal fume fever – metallic taste in mouth, dryness, and irritation of the throat, and influenza-like symptoms. The effects may be delayed.

CARCINOGENICITY:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper (fume, dusts &amp; mists)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

See Toxicological Information (Section #11)

POTENTIAL ENVIRONMENTAL EFFECTS:
None known. Product has not been tested for environmental properties.

3.0 CHEMICAL COMPONENTS

NOTE: This MSDS applies to a range of alloys. For actual compositions refer to material test report or specific alloy specification. All percentages are by weight.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS #</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>99.8 – 99.99</td>
</tr>
</tbody>
</table>

4.0 FIRST AID MEASURES

INHALATION: If exposed to excessive levels of metal fumes, remove to fresh air. Seek medical attention.

EYE: Flush with water for at least 15 minutes.

SKIN: Wash with soap and water.
5.0 FIRE FIGHTING MEASURES

**Suitable Extinguishing Media:** Use extinguishing media appropriate to the surrounding material.

**Special Firefighting Instructions:** Copper alloy products in the solid state present no fire or explosion hazard, but may react with strong acids, bases, or oxidizing agents.

6.0 ACCIDENTAL RELEASE MEASURES

**Steps to be Taken in the Event of Spills, Leaks, or Releases:** Not applicable

7.0 HANDLING AND STORAGE

**Handling:** In welding, precautions should be taken for airborne contaminants that may originate from components of the welding rod.

8.0 EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Guidelines**

<table>
<thead>
<tr>
<th>Component</th>
<th>OSHA PEL TWA</th>
<th>ACGIH® TLV® TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper dust, mist</td>
<td>1.0 mg/m³</td>
<td>1.0 mg/m³</td>
</tr>
<tr>
<td>Copper fume</td>
<td>0.1 mg/m³</td>
<td>0.2 mg/m³</td>
</tr>
</tbody>
</table>

**Engineering Controls:** Local exhaust ventilation should be utilized when welding, burning, sawing, brazing, grinding, or machining when exposure exceeds occupational exposure limits.

**Eye Protection:** Safety glasses or goggles should be utilized as required by exposure. Other protective equipment should be utilized as required by welding standards.

**Skin Protection:** Wear appropriate personal protective clothing to prevent skin contact with copper dusts and mists.

**Respiratory Protection:** NIOSH-approved dust or fume respirator should be used to avoid excessive inhalation of particulates when exposure exceeds occupational exposure limits.

**Other Preventive Measures:** Do not eat, drink, or smoke during work. Wash hands before eating or smoking.
9.0 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Salmon-colored, lustrous metal
ODOR: None
PH: Not applicable
VAPOR DENSITY (Air = 1): Not applicable
PHYSICAL STATE: Solid
VAPOR PRESSURE: Not applicable
PERCENT VOLATILE: Not applicable
EVAPORATION RATE: Not applicable
SPECIFIC GRAVITY: 8.9
SOLUBILITY IN WATER: Not applicable
DENSITY, LB/IN^3: 0.3230
MELTING POINT: 1,981 °F
FLASH POINT: Not applicable
LOWER EXPLOSIVE LIMIT (%): None
AUTOIGNITION TEMPERATURE: Not applicable
UPPER EXPLOSIVE LIMIT (%): None

10.0 STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable
CONDITIONS TO AVOID: None
INCOMPATIBLE MATERIALS: Mercury, ammonia, acetylene acids. Contact with strong acids, bases, or oxidizing agents
HAZARDOUS DECOMPOSITION PRODUCTS: Metallic dust or fumes may be produced during welding, burning, grinding, and machining.
POSSIBILITY OF HAZARDOUS REACTIONS: Will not occur

11.0 TOXICOLGY INFORMATION

ACUTE TOXICITY DATA FOR COMPONENTS
Copper TDLo: 120 µg/kg (human, oral—gastrointestinal effects)
LD_{50}: 0.07 mg/kg (mouse, intraperitoneal)

CHRONIC EFFECTS:
Repeated or prolonged overexposure to copper fume may cause the skin and hair to change color.

12.0 ECOLOGICAL INFORMATION

Not applicable
13.0 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS:
According to local, state, and federal regulations.

14.0 TRANSPORT INFORMATION

Not applicable

15.0 REGULATORY INFORMATION

GLOBAL INVENTORIES

<table>
<thead>
<tr>
<th></th>
<th>COPPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA: United States</td>
<td>Included</td>
</tr>
<tr>
<td>DSL: Canada</td>
<td>Included</td>
</tr>
<tr>
<td>EINECS: European Union:</td>
<td>Included</td>
</tr>
</tbody>
</table>

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):
These alloys are not regulated under Section 302 of SARA and 40 CFR 355.

SARA TITLE III SECTION 311/312 HAZARDOUS CATEGORIZATION (40 CFR 370):
OSHA defines these alloys as hazardous 29 CFR 1910.1200(d).

SARA TITLE III SECTION 313 TOXIC CHEMICALS (40 CFR 372):
These alloys may contain the following toxic chemical(s) subject to reporting requirements under this section of SARA and of 40 CFR 372:

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<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>≥ 99.8</td>
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OTHER LISTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CA Prop 65 Chemical</th>
<th>MA Toxic Substance List</th>
<th>MI Critical Materials Register</th>
<th>NJ Hazardous Substances List</th>
<th>PA Right-to-Know List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

16.0 OTHER INFORMATION

REFERENCES

ACGIH® Threshold Limit Values (TLV®) (2004)
Agency for Toxic Substances and Disease Registry (ATSDR):
Toxicological Profile for Copper, September 2002

December 15, 2004
International Agency for Research on Cancer (IARC) Monographs

National Library of Medicine (NLM) Databases:

ChemID
Integrated Risk Information (IRIS)
International Toxicity Estimates for Risk (ITER)
Chemical Carcinogenesis Risk Information System (CCRIS)
Hazardous Substances Data Bank (HSDB)

National Toxicology Program (NTP) Reports
NIOSH/OSHA Occupational Health Guideline for Copper Fume
NIOSH/OSHA Occupational Health Guideline for Copper Dusts and Mists
OSHA General Industry Standards (29 CFR 1910)

Registry of Toxic Effects of Chemical Substances (RTECS®)

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PREPARATION INFORMATION

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December 15, 2004