Silver-Copper-Phosphorus Alloys
Safety Data Sheet

1. Product and Company Identification
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Manufacturer
----------
Lucas-Milhaupt, Inc.
5656 South Pennsylvania Avenue
Cudahy, WI 53110 USA
Telephone: 414-769-6000
www.lucasmilhaupt.com

Emergency Phone Number
------------------------
CHEMTREC: within USA or Canada 1-800-424-9300
CHEMTREC: outside USA or Canada 1-704-741-5970

SDS Number: 77

Product: AG-CU-P

Product Codes: 28704 (SIL-FOS 10), 71-100 (SIL-FOS 10), 34286 (SIL-FOS 5M), 26310 (SIL-FOS 1), 27953 (SIL-FOS 1), 2774 (SIL-FOS 2), 71-020 (SIL-FOS 2), 34649 (SIL-FOS 2F), 28134 (SIL-FOS 2M), 35502 (SIL-FOS 2M), 71-017 (SIL-FOS 2M), 35503 (SIL-FOS 5), 25841 (SIL-FOS 5), 7054 (SIL-FOS 5), 71-050 (SIL-FOS 5), 28118 (SIL-FOS 5F), 71-052 (SIL-FOS 5F), 17152 (HANDY-FLO 6), 71-062 (HANDY-FLO 6), 17244 (HANDY-FLO 6), 35542 (SIL-FOS 6i), 71-063 (SIL-FOS 6i), 28126 (SIL-FOS 6i), 71-060 (SIL-FOS 6i), 29538 (SIL-FOS 15i), 7153 (SIL-FOS 15), 71-150 (SIL-FOS 15), 26047 (SIL-FOS 15), 35528 (SIL-FOS 15i), 35544 (SIL-FOS 15LP), 19422 (SIL-FOS 18M), 31138 (SIL-FOS 18M), 35207 (SIL-FOS 18M), 71-181 (SIL-FOS 18M), 35216 (SIL-FOS 18), 71-180 (SIL-FOS 18)

Product Use(s): Alloys for brazing and other metallurgical processes

2. Hazards Identification
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Classification(s): None applicable

Label Symbol(s): None applicable

Label Signal Word(s): None applicable

Label Hazard Statement(s): None applicable

Label Precautionary Statement(s)
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The acute toxicities of 74-94% of the product’s ingredients are unknown.

3. Composition/Information on Ingredients
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<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>%</th>
<th>Impurities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>74-94</td>
<td>None known</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>7723-14-0</td>
<td>2-8</td>
<td>None known</td>
</tr>
<tr>
<td>Silver</td>
<td>7440-22-4</td>
<td>&lt;1-19</td>
<td>None known</td>
</tr>
</tbody>
</table>
4. First Aid Measures
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Eye
---
Flush affected areas with water for at least fifteen minutes. Seek medical assistance if necessary.

Skin
----
Remove contaminated clothing. Wash affected area with large quantities of water for at least five minutes. Seek medical attention if necessary. Launder or dry-clean clothing before reuse.

Ingestion
--------
If subject is conscious, induce vomiting. If unconscious or convulsive, seek immediate medical assistance. Do not give anything by mouth to an unconscious or convulsive person.

Inhalation
---------
If signs and symptoms of toxicity are observed, remove subject from area, administer oxygen, and seek medical attention. Keep the subject warm and at rest. Perform artificial respiration if breathing has stopped.

Note to Physician or Poison Control Center
------------------------------------------
None of the components are acutely toxic by ingestion, nor are they absorbed through the skin. Long-term chronic exposure may cause argyria.

5. Fire Fighting Measures
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Fire and Explosion Hazards
-------------------------
These products are non-flammable and non-explosive. If present in a fire or explosion, they may emit fumes of the constituent metals and/or phosphorus pentoxide.

Extinguishing Media
---------------------
Use dry chemical. Do not use water.

Fire Fighting Instructions
--------------------------
If fighting a fire in which these products are present, wear a self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode.

6. Accidental Release Measures
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Methods and Materials
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If a finely-divided form of product is spilled, clean up spillage so as to minimize dispersion of dust. Either wet sweeping or vacuuming using HEPA filtration is recommended.

Personal Precautions
---------------------
Avoid contact with skin, eyes, and mucous membranes.
Environmental Precautions
---------------------------------
Prevent spills from entering sewers or contaminating soil.

7. Handling and Storage
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Handling Precautions
---------------------------------
No special handling precautions are required.

Work and Hygiene Practices
---------------------------------
To prevent ingestion following use of the product, wash hands and face before eating, drinking, applying cosmetics, or using tobacco. Remove contaminated clothing or protective equipment before entering eating/drinking areas.

Storage Precautions
---------------------------------
Do not store in proximity to incompatible materials (see Section #10).

8. Exposure Controls and Personal Protection
---------------------------------------------
Ingredients - Exposure Limits
---------------------------------------------
Copper
   ACGIH TLVs: 0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dusts and mists)
   OSHA PELs: 0.1 mg/m3 TWA (fume); 1 mg/m3 TWA (dusts and mists)
Phosphorus
   No applicable ACGIH TLV(s)
   No applicable OSHA PEL(s)
Silver
   ACGIH TLV: 0.1 mg/m3 TWA (metal)
   OSHA PEL: 0.01 mg/m3 TWA

Ingredients - Biological Limits
---------------------------------------------
Copper
   No ACGIH BEI(s) or other biological limit(s)
Phosphorus
   No ACGIH BEI(s) or other biological limit(s)
Silver
   No ACGIH BEI(s) or other biological limit(s)

Engineering Controls
---------------------------------------------
Use dilution or local exhaust ventilation adequate to maintain concentrations of all components and their byproducts to within their applicable standards.

Eye/Face Protection
---------------------------------------------
Wear eye protection adequate to prevent eye contact with the product and injury if the product is used with a flame. Plastic-frame spectacles with side shields are recommended.

Skin Protection
---------------------------------------------
Wear protective gloves and clothing to prevent skin injuries if the product is used with a flame. Avoid flammable fabrics.

Respiratory Protection
---------------------------------------------
If an exposure level to a component(s) exceeds an applicable standard, use a NIOSH-approved respirator having a configuration (facepiece, filter media,
assigned protection factor, etc.) effective for the concentration of the component(s) generated. For guidance on selection and use of respirators, consult American National Standard Z88.2 (ANSI, New York, NY 10036, USA).

9. Physical and Chemical Properties
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Appearance: Yellow-white metals, various forms
Odor: none
Odor threshold: not applicable
pH: not applicable
Melting Point: approx. 1,178°F./637°C.
Freezing point: not applicable
Boiling point/boiling range: not determined
Flash Point: not applicable
Evaporation Rate: not applicable
Flammability Class: not applicable
Lower Explosive Limit: not applicable
Upper Explosive Limit: not applicable
Vapor pressure: not applicable
Vapor density: not applicable
Relative density (H2O): 7.4–8.6
Solubility (H2O): insoluble
Oil-water partition coefficient: not applicable
Autoignition Point: not applicable
Decomposition temperature: not applicable
Viscosity: not applicable

10. Stability and Reactivity
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Reactivity: none reasonably foreseeable
Stability: stable
Hazardous Polymerization: will not occur
Risk of Dangerous Reactions: silver and copper can form unstable acetylenes in contact with acetylene gas.

Incompatible Materials
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Strong oxidizers; ammonia; azides; nitric acid; ethylene imine; sulfuric acid; chlorine trifluoride; inorganic and organic peroxides; peroxoformic acid; oxalic acid; bromates, chlorates, and iodates of alkali and alkaline earth metals; tartaric acid; 1-bromo-2-propyne; permonosulfuric acid; alkaline hydroxides.

Hazardous Decomposition Products
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Heating to elevated temperatures may liberate fumes of the constituent metals and/or phosphorus pentoxide.

10. Toxicological Information
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Ingredients - Toxicological Data
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Copper
LD50: No data available
LC50: No data available
Phosphorus
LD50: >15,000 mg/kg (oral/rat)
LC50: 4,300 mg/m3 for 1 hr (rat)
Silver
LD50: >2,000 mg/kg (oral/rat)
LC50: No data available
Primary Routes(s) of Entry
----------------------------------
Ingestion; inhalation.

Eye Hazards
----------
Eye contact with these products in finely-divided forms may cause irritation, conjunctivitis, ulceration of the cornea, and/or argyria, a permanent gray discoloration of the eyes, skin, mucous membranes, and respiratory tract.

Skin Hazards
----------
Skin contact with these products in finely-divided forms may cause irritation, argyria, discoloration, and/or contact dermatitis.

Ingestion Hazards
----------
Ingestion of these products may cause nausea, vomiting, and gastrointestinal irritation.

Inhalation Hazards
----------
Inhalation of toxicologically-significant quantities of the components is unlikely when the product is used in accordance with instructions and specified protective measures (see Section #8). When phosphorus is overheated in air, it is converted to phosphorus pentoxide, which is corrosive and irritating to eyes, nose, throat, and mucous membranes.

Symptoms Related to Overexposure
----------------------------------
Pre-existing pulmonary diseases (e.g., bronchitis, asthma) may be aggravated by inhalation overexposure, particularly as fume.

Delayed Effects from Long Term Overexposure
----------------------------------------------
Chronic overexposure by inhalation and/or ingestion may aggravate pre-existing diseases of the liver, kidneys, and gastrointestinal system.

Carcinogenicity
----------
The product contains no chemicals classified as potential or demonstrated carcinogens by IARC, NTP, or OSHA.

Germ Cell Mutagenicity
----------
The product contains no chemicals determined to be germ cell mutagens.

Reproductive Effects
----------
The product contains no chemicals determined to be damaging to fertility or to the unborn child.

Acute Toxicity Estimates
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LD50 {oral}: >2,000 mg/kg
LD50 {dermal}: no data available
LC50: 4,300 mg/m3

Interactive Effects of Components: no data available
12. Ecological Information
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No ecological data is available for the product or any of its components.

Ozone Depletion Potential: This product contains no ingredients listed in the Annexes to the Montréal Protocol on Substances that Deplete the Ozone Layer.

13. Disposal Considerations
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Do not discharge waste product into sanitary or storm sewers or allow it to contaminate soil. Consult applicable Federal, State/Provincial, and local regulations.

14. Transport Information
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Transport is not regulated by USDOT, TDG (Canada), IATA, or IMO.

15. Regulatory Information
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United States Regulatory Information
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All components of this product are listed on the EPA's TSCA inventory.

SARA Hazard Classes: Chronic Health Hazard

SARA Section 313 Notification
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This product contains these components in concentrations >1% (>0.1% for carcinogens) subject to Section 313 of the Emergency Preparedness and Community Right-to-Know Act (EPCRA) of 1986 and 40CFR, Part 372:
1. Copper (CASRN 7440-50-8)
2. Phosphorus (CASRN 7723-14-0)
3. Silver (CASRN 7440-22-4)

Canadian Regulatory Information
--------------------------------
All components of these products are listed on either the Domestic Substances List (DSL) or the Nondomestic Substances List (NDSSL).

WHMIS Class(es) and Division(s): D2B
Components on Ingredients Disclosure List:
1. Copper, elemental (CASRN 7440-50-8)
2. Phosphorus (CASRN 7723-14-0)
3. Silver, elemental (CASRN 7440-22-4)

This product has been classified according to the hazard criteria of the CPR and this SDS contains all of the information required by the CPR.

16. Other Information
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HMIS Ratings (Legend)
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Health - 2* (moderate chronic hazard)
Flammability - 1 (slight hazard)
Physical Hazard - 0 (minimal hazard)
PPE - see Note
Note: Lucas-Milhaupt Inc. recommends use of protective eyewear and gloves (Personal Protection Index "B") as standard PPE. HMIS recommends that its ratings be used only in conjunction with a fully implemented HMIS program, and that specific PPE codes be created by the user, who is familiar with the actual conditions under which the product is used. We cannot anticipate every condition of the product's use, and it is the user's responsibility to evaluate the hazards pertinent to its specific operations, and to determine the specific PPE required.

NFPA Ratings
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Health - 2   Flammability - 1   Reactivity - 0

Preparation Information
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Date of Preparation: 22 December 2015
Date of Prior SDS: 8 December 2014

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Lucas-Milhaupt, Inc.