HANDY ONE Silver-Copper-Zinc-Tin Alloy (Pro Flux)

Safety Data Sheet

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

Emergency Phone Number
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CHEMTREC within the USA and Canada: 1-800-424-9300
CHEMTREC outside the USA and Canada: +1 703-741-5970

SDS Number: 476
Product: HANDY ONE Silver-Copper-Zinc-Tin Alloy (Pro Flux)

Product Codes: 30-255 (HANDY ONE SILVALOY 255), 30-340 (HANDY ONE SILVALOY 340), 30-341 (HANDY ONE SILVALOY 340), 30-343 (HANDY ONE SILVALOY 340), 30-380 (HANDY ONE SILVALOY 380), 35705 (HANDY ONE SILVALOY 380), A00000201 (HANDY ONE SILVALOY 380), 30-384 (HANDY ONE SILVALOY 380), 30-386 (HANDY ONE SILVALOY 380), 30-388 (HANDY ONE SILVALOY 380), 30-405 (HANDY ONE SILVALOY 402), 30-560 (HANDY ONE SILVALOY 560), 35706 (HANDY ONE SILVALOY 560), A00000202 (HANDY ONE SILVALOY 560), 30-564 (HANDY ONE SILVALOY 560)

Product Use(s): Brazing alloys with a flux core

2. Hazards Identification
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Classification(s)
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Specific Target Organ Toxicity, Single Exposure: Hazard Category 3

Label Symbol(s): Exclamation Point

Label Signal Word(s): Warning

Label Hazard Statement(s)
-------------------------
May cause respiratory irritation.

Label Precautionary Statement(s)
--------------------------------
Do not handle until all safety precautions have been read and understood. Avoid breathing dust or fumes. Use only outdoors or in a well-ventilated area.

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a doctor/Poison Control Center if you feel unwell.

Store locked up. Dispose of contents/container in accordance with applicable regulations. The acute toxicities of 40-70% of the product’s ingredients are unknown.
### 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>CAS Number</th>
<th>%</th>
<th>Impurities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>20-40</td>
<td>None known</td>
</tr>
<tr>
<td>Potassium fluoride</td>
<td>7789-23-3</td>
<td>&lt;1</td>
<td>None known</td>
</tr>
<tr>
<td>Potassium hydrogen difluoride</td>
<td>7789-29-9</td>
<td>&lt;1</td>
<td>None known</td>
</tr>
<tr>
<td>Potassium fluoborate</td>
<td>14075-53-7</td>
<td>3-8</td>
<td>None known</td>
</tr>
<tr>
<td>Potassium tetraborate</td>
<td>1332-77-0</td>
<td>2-6</td>
<td>None known</td>
</tr>
<tr>
<td>Silver</td>
<td>7440-22-4</td>
<td>25-45</td>
<td>None known</td>
</tr>
<tr>
<td>Tin</td>
<td>7440-31-5</td>
<td>1-3</td>
<td>None known</td>
</tr>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>20-35</td>
<td>None known</td>
</tr>
</tbody>
</table>

### 4. First Aid Measures

**Eye**
---
Not applicable.

**Skin**
----
Not applicable.

**Ingestion**
-------
Not applicable.

**Inhalation**
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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**
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The components potassium hydrogen difluoride and potassium fluoride are acutely toxic by ingestion. Their combined concentration in the product is <20 gm/kg. However, inhalation is the only plausible mode of occupational exposure, as these components are within the core of the wire. Inhalation of zinc-containing fume may cause acute respiratory illness.

### 5. Fire Fighting Measures

**Extinguishing Media**
-----------------------
Not applicable.

**Fire and Explosion Hazards**
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This product is non-flammable and non-explosive. However, if present in a fire or explosion, it may emit fumes of the constituent metals or metal oxides, fluorides, and boron oxide.

**Fire Fighting Instructions**
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If fighting a fire in which this product is present, wear a self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode.
6. Accidental Release Measures
----------------------------------
Not applicable.

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

Work and Hygiene Practices
--------------------------
As good hygiene practice, 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
--------------------
Store away from 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 (dust and mist)
OSHA PELs: 0.1 mg/m³ TWA (fume), 1 mg/m³ TWA (dust and mist)

Potassium hydrogen difluoride, potassium fluoride, and potassium fluoborate
ACGIH TLV: 2.5 mg/m³ TWA (as F⁻)
OSHA PEL: 2.5 mg/m³ TWA (as F⁻)

Potassium tetraborate
No ACGIH TLV(s)
No OSHA PEL(s)

Silver
ACGIH TLV: 0.1 mg/m³ TWA
OSHA PEL: 0.01 mg/m³ TWA

Tin
ACGIH TLV: 2 mg/m³ TWA (as Sn)
OSHA PEL: 2 mg/m³ TWA (as Sn)

Zinc (as ZnO)
ACGIH TLVs: 2 mg/m³ TWA; 10 mg/m³ STEL (as respirable fractions)
OSHA PEL: 5 mg/m³ TWA

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

Potassium hydrogen difluoride, potassium fluoride, and potassium fluoborate
ACGIH BEIs for fluoride in urine: 2 mg/l. prior to shift
3 mg/l. end of shift

Potassium tetraborate
No ACGIH BEI(s) or other biological limit(s)

Silver
No ACGIH BEI(s) or other biological limit(s)

Tin
No ACGIH BEI(s) or other biological limit(s)

Zinc
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 injury from the hazards of brazing. Plastic-frame spectacles with side shields are recommended.

Skin Protection
-------------
Wear protective gloves and clothing to prevent skin injuries from the hazards of brazing. 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: Light yellow metals in the form of flux-cored wire
Odor: no odor
Odor threshold: not applicable
pH: not applicable
Melting point: approx. 1,145F./620C.
Freezing point: not applicable
Boiling point/boiling range: not applicable
Flash Point: not applicable
Autoignition Point: not applicable
Flammability Class: not applicable
Lower/Upper Explosive Limits: not applicable
Vapor pressure: not applicable
Vapor density: not applicable
Evaporation Rate: not applicable
Relative density (H2O): 7.5-10.0
Solubility (H2O): insoluble
Oil-water partition coefficient: not applicable
Decomposition temperature: not determined
Viscosity: not applicable

10. Stability and Reactivity
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Reactivity: none reasonably foreseeable
Stability: stable
Hazardous Polymerization: will not occur
Possible Hazardous Reactions: Silver and copper can form unstable acetylides in contact with acetylene gas.

Incompatible Materials
-----------------------
Acetylene; ammonia; azides; nitric acid; halogens; ethylene imine; ethylene oxide; chlorine trifluoride; sulfuric acid; peroxides; peroxycacid acid; oxalic acid; tartaric acid; 1-bromo-2-propyne; permonosulfuric acid; hydrazine mononitrate; hydrazoic acid; hydrogen sulfide; bromates, chlorates, and iodates of alkali and alkali earth metals; hydroxylamine; selenium; tellurium; carbon disulfide; cupric nitrate.
Potential Hazardous Decomposition Products
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Boron oxide, fluorides, carbon monoxide, smoke, and irritant decomposition byproducts.

11. Toxicological Information
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This product has not been tested for toxicology by the manufacturer.

Ingredients - Toxicological Data
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Copper
   LD50: No data available   LC50: No data available
Potassium hydrogen difluoride
   LD50: No data available   LC50: No data available
Potassium fluoride
   LD50: 245 mg/kg (oral/rat)   LC50: No data available
Potassium fluoborate
   LD50: 5,854 mg/kg (oral/rat)   LC50: No data available
Potassium tetraborate
   LD50: No data available   LC50: No data available
Silver
   LD50: >2,000 mg/kg (oral/rat)   LC50: No data available
Tin
   LD50: No data available   LC50: No data available
Zinc
   LD50: No data available   LC50: No data available

Primary Routes(s) of Entry
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Inhalation.

Eye Hazards
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As a solid, eye contact is not a plausible mode of exposure.

Skin Hazards
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As a solid, skin contact is not a plausible mode of exposure.

Ingestion Hazards
-----------------
As a solid, ingestion is not a plausible mode of exposure.

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). Inhalation of zinc oxide fume can cause severe respiratory system irritation.

Symptoms Related to Overexposure
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Overexposure by inhalation may cause irritation to the nose, throat, and respiratory tract and/or cough, nose bleeds, nausea, vomiting, chest tightness, chills, fever, pneumonitis, tearing, and pulmonary edema.
Delayed Effects from Long Term Overexposure

Aggravation of pre-existing diseases of the skeletal, gastrointestinal, and nervous systems. Long-term overexposure via inhalation may cause fluorosis (a disease characterized by mottled teeth, osteosclerosis, and pain and loss of mobility in joints).

Carcinogenicity

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

Germ Cell Mutagenicity

Some inorganic fluorides have been demonstrated to induce mutagenic changes in mammalian cells in culture. No such effects in humans from occupational exposure to potassium hydrogen difluoride, potassium fluoride, or potassium fluoborate have been established.

Reproductive Effects

This product contains no chemicals determined to be damaging to fertility or to the unborn child.

Acute Toxicity Estimates

LD50 (oral): >2,000 mg/kg
LD50 (dermal): no data available
LC50: no data available
Interactive Effects of Components: no data available

12. Ecological Information

No ecological data is available for the product. Ecological data for the components is as follows:

Potassium Fluoride

Aquatic Toxicity to Fish: LC50 = 64 mg/l. for 240 h. (Trout)
Aquatic Toxicity to Invertebrates: EC50 = 270 mg/l. (Daphnia)
Aquatic Toxicity to Plants: EC50 = 95 mg/l. for 96 h. (Algae)
Aquatic Toxicity to Microorganisms: EC50 = 101 mg/l. (Protozoa)
No data available for Toxicity to Terrestrial Organisms, Persistence and Degradability, Bioaccumulation Potential, or Mobility in Soil.

Potassium Hydrogen Difluoride/Potassium Fluoborate/Copper/Silver/Tin/Zinc

No data available for Aquatic Toxicity to Fish, Invertebrates, Plants, Microorganisms, Toxicity to Terrestrial Organisms, Persistence and Degradability, Bioaccumulation Potential, or Mobility in Soil.

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. Disposal of products containing fluorides or borates may be subject to restrictions. 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: Acute Health Hazard; Chronic Health Hazard

SARA Section 313 Notification: This product contains these ingredients in concentrations >1% (for carcinogens >0.1%) regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372:
   1. Copper (CASRN 7440-50-8)
   2. Silver (CASRN 7440-22-4)

Canadian Regulatory Information
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All components of this product are listed on either the Domestic Substances List (DSL) or the Nondomestic Substances List (NDSL).

This product has been classified in accordance with Canada’s Hazardous Products Regulations (SOR/DORS/2015-17).

16. Other Information
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HMIS Ratings (Legend)
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Health - 2* (moderate chronic hazard)
Flammability - 0 (minimal 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 for Product
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Health - 2     Flammability - 0     Reactivity - 0
Preparation Information
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Date of Preparation: 13 July 2016
Date of Prior SDS: 8 June 2016

Disclaimer
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Lucas-Milhaupt, Inc.