Silver-Copper-Zinc-Nickel 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 and Canada 1-800-424-9300
CHEMTREC: outside USA and Canada 1-703-741-5970

SDS Number: 88
Product: AG-CU-ZN-NI

Product Codes: ESP1A (TRIMET 259), 38-259 (TRIMET 259), ESP2B (TRIMET 201), 38-201 (TRIMET 201), 38-202 (TRIMET 202), 35597 (SILVALOY 299), 32-299 (SILVALOY 299), 2501 (SILVALOY 403), 32-403 (SILVALOY 403), 9704 (SILVALOY 404), 32-404 (SILVALOY 404), 17095 (SILVALOY 505), 32-505 (SILVALOY 505), 6544 (SILVALOY 541), 32-541 (SILVALOY 541), 40-075 (BLA-075), 69-207, 70-005

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

2. Hazards Identification
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Classification(s)
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Skin Sensitization: Hazard Category 1B
Carcinogenicity: Hazard Category 2
Specific Target Organ Toxicity, Single Exposure:
  Hazard Category 3

Label Symbol(s): Health Hazard, Exclamation Point

Label Signal Word(s): Warning

Label Hazard Statement(s)
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May cause respiratory irritation.
May cause an allergic skin reaction.
Suspected of causing cancer by inhalation.

Label Precautionary Statement(s)
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Do not handle until all safety precautions have been read and understood.
Obtain special instructions before use.
Avoid breathing dust or fumes.
Use only outdoors or in a well-ventilated area. Store locked up.
Wear protective gloves and eye/face protection.
If skin irritation or rash occurs, get medical advice or attention.
If exposed or concerned, get medical advice/attention.
IF ON SKIN: Wash with plenty of water. Wash contaminated clothing before reuse. Contaminated work clothing must not be allowed out of the workplace.

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

Dispose of contents and container in accordance with applicable regulations. The acute toxicities of 20–90% of the products’ ingredients are unknown.

WARNING: These products contain chemicals known to the State of California to cause cancer.

3. Composition/Information on Ingredients

<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>15-70</td>
<td>None known</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-2</td>
<td>&lt;1-20</td>
<td>None known</td>
</tr>
<tr>
<td>Silver</td>
<td>7440-22-4</td>
<td>10-70</td>
<td>None known</td>
</tr>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>5-45</td>
<td>None known</td>
</tr>
</tbody>
</table>

4. First Aid Measures

Eye
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Flush affected areas with water for at least fifteen minutes. Seek medical assistance if necessary.

Skin
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Remove contaminated clothing. Wash affected areas 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. Skin exposure may cause contact or allergic dermatitis and/or argyria.

5. Fire Fighting Measures

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 or their oxides.
Extinguishing Media
----------------------
Use dry chemical. Do not use water.

Fire Fighting Instructions
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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
---------------------------------
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, using personal protective equipment as necessary.

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

8. Exposure Controls and Personal Protection
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Ingredients - Exposure Limits
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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)
Nickel
   ACGIH TLV: 1.5 mg/m3 TWA
   OSHA PEL: 1 mg/m3 TWA
Silver
   ACGIH TLV: 0.1 mg/m3 TWA (metal)
   OSHA PEL: 0.01 mg/m3 TWA
Zinc
   ACGIH TLVs (as ZnO): 2 mg/m3 TWA; 10 mg/m3 STEL (respirable fractions)
   OSHA PEL: 5 mg/m3 TWA (as respirable fraction of ZnO dust or fume)
Ingredients - Biological Limits

Copper
No ACGIH BEI(s) or other biological limit(s)
Nickel
No ACGIH BEI(s) or other biological limit(s)
Silver
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 eye injury if the products are 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 products are 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

Appearance: White or light-yellow metals, various forms
Odor: none
Odor threshold: not applicable
pH: not applicable
Melting Point: approx. 1,207F./653C.
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): 8.35–9.70
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 acetylides in contact with acetylene gas.

Incompatible Materials
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Acetylene; ammonia; ammonium nitrate; azides; nitric acid; halogens; ethylene imine; ethylene oxide; chlorine trifluoride; sulfuric acid; peroxides; peroxyformic acid; oxalic acid; tartaric acid; 1-bromo-2-propyne; hydrazine mononitrate; hydrazine; hydrazoic acid; permonosulfuric acid; hydroxylamine; hydrogen sulfide; bromates, chlorates, and iodates of alkali and alkali earth metals; selenium; tellurium; carbon disulfide; performic acid; phosphorus; sulfur; dioxane; titanium plus potassium chloride.

Hazardous Decomposition Products
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Heating to elevated temperatures may liberate metal/metal oxide fumes.

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
Nickel
   LD50: >5,000 mg/kg (oral/rat)  LC50: No data available
Silver
   LD50: >2,000 mg/kg (oral/rat)  LC50: No data available
Zinc
   LD50: No data available  LC50: No data available

Primary Routes(s) of Entry
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Ingestion; inhalation.

Eye Hazards
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Eye contact with this product 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
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Skin contact with this product in finely-divided forms may cause irritation and/or argyria.

Ingestion Hazards
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Ingestion of finely-divided forms of product may cause nausea, vomiting, and gastrointestinal irritation.

Inhalation Hazards
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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).

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

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

Carcinogenicity
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Nickel is classified as a potential human carcinogen by IARC (“2b”, possibly carcinogenic to humans) and NTP (“K”, known to be a human carcinogen). Exposure to some compounds of nickel has been shown to increase the risk of various cancers, although these effects have not been demonstrated among individuals occupationally exposed only to nickel metal. ACGIH classifies nickel metal as “A5” (not suspected as a human carcinogen).

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

Nickel
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Aquatic Toxicity to Fish: LC50 >100 mg/l. for 4 d. (Freshwater fish)
Aquatic Toxicity to Invertebrates: EC50 >100 mg/l. for 48 h. (Daphnia)
Aquatic Toxicity to Plants: EC50 = 0.18 mg/l. for 3 d. (Algae)
No data available for Aquatic Toxicity to Microorganisms, Toxicity to Terrestrial Organisms, Persistence and Degradability, Bioaccumulation Potential, or Mobility in Soil.

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

Ozone Depletion Potential: The products contain 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 allow the product 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 these products are listed on the EPA’s TSCA inventory.

SARA Hazard Classes: Acute Health Hazard; Chronic Health Hazard

SARA Section 313 Notification
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These products contain 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 of 40CFR, Part 372:
1. Copper (CASRN 7440-50-8)
2. Nickel (CASRN 7440-02-0)
3. Silver (CASRN 7440-22-4)

U.S. State Regulations
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Nickel (CASRN 7440-02-0) – California Proposition 65 listed chemical

Canadian Regulatory Information
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All components of these products 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 – 1 (slight hazard)
Physical Hazard – 1 (slight 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 – 1
Preparation Information
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Date of Preparation: 18 December 2015
Date of Prior SDS: 12 December 2014

Disclaimer
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Lucas-Milhaupt, Inc.