### SECTION 1: Identification

#### 1.1. Identification

- **Product form**: Mixture
- **Trade name**: SILVALOY® 403
- **Product code**: A00000012

#### 1.2. Recommended use and restrictions on use

- **Recommended use**: Alloys for brazing/soldering and other metallurgical processes

#### 1.3. Supplier

Lucas-Milhaupt, Inc.
5656 South Pennsylvania Ave.
Cudahy, WI 53110 - USA
T (414)-769-6000
LM_SDSinfo@lucasmilhaupt.com - www.Lucasmilhaupt.com

#### 1.4. Emergency telephone number

- **Emergency number**: CHEMTREC within the USA and Canada: 1-800-424-9300
  CHEMTREC outside the USA and Canada +1 701-741-5970

### SECTION 2: Hazard(s) Identification

#### 2.1. Classification of the substance or mixture

**GHS-US classification**

- **Skin sensitisation, Category 1**: H317 - May cause an allergic skin reaction.
- **Carcinogenicity, Category 1B**: H350 - May cause cancer.
- **Specific target organ toxicity - Repeated exposure, Category 1**: H372 - Causes damage to organs through prolonged or repeated exposure.

Full text of H statements : see section 16

#### 2.2. GHS Label elements, including precautionary statements

**GHS-US labelling**

- **Hazard pictograms (GHS-US)**: ![Hazard pictograms](image)

- **Signal word (GHS-US)**: Danger

- **Hazard statements (GHS-US)**: H317 - May cause an allergic skin reaction.
  H350 - May cause cancer.
  H372 - Causes damage to organs through prolonged or repeated exposure.

- **Precautionary statements (GHS-US)**: P201 - Obtain special instructions before use.
  P202 - Do not handle until all safety precautions have been read and understood.
  P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
  P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
  P264 - Wash hands, forearms and face thoroughly after handling.
  P270 - Do not eat, drink or smoke when using this product.
  P272 - Contaminated work clothing must not be allowed out of the workplace.
  P280 - Wear protective gloves/protective clothing/eye protection/face protection.
  P302+P352 - If on skin: Wash with plenty of water.
  P308+P313 - If exposed or contaminated: Get medical advice/attention.
  P314 - Get medical advice/attention if you feel unwell.
  P321 - Specific treatment (see supplemental first aid instruction on this label).
  P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
  P363 - Wash contaminated clothing before reuse.
  P405 - Store locked up.
  P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
2.3. Other hazards which do not result in classification
No additional information available

2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/information on ingredients
3.1. Substances
Not applicable

3.2. Mixtures

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver</td>
<td>(CAS-No.) 7440-22-4</td>
<td>39 - 41</td>
</tr>
<tr>
<td>Copper</td>
<td>(CAS-No.) 7440-50-8</td>
<td>29 - 31</td>
</tr>
<tr>
<td>Zinc</td>
<td>(CAS-No.) 7440-66-6</td>
<td>26 - 30</td>
</tr>
<tr>
<td>Nickel</td>
<td>(CAS-No.) 7440-02-0</td>
<td>1.5 - 2.5</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures
4.1. Description of first aid measures
First-aid measures general : IF exposed or concerned: Get medical advice/attention.
First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact : Take off contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention. Wash skin with plenty of water.
First-aid measures after eye contact : Rinse eyes with water as a precaution.
First-aid measures after ingestion : Call a poison center or a doctor if you feel unwell. Rinse mouth.

4.2. Most important symptoms and effects (acute and delayed)
Symptoms/effects after skin contact : May cause an allergic skin reaction.

4.3. Immediate medical attention and special treatment, if necessary
Treat symptomatically.

SECTION 5: Fire-fighting measures
5.1. Suitable (and unsuitable) extinguishing media
Suitable extinguishing media : Dry powder. Water spray. Foam.
Unsuitable extinguishing media : Water.

5.2. Specific hazards arising from the chemical
Reactivity : The product is non-reactive under normal conditions of use, storage and transport.

5.3. Special protective equipment and precautions for fire-fighters
Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
6.1.1. For non-emergency personnel
Emergency procedures : Do not breathe dust/fume/gas/mist/vapours/spray. Only qualified personnel equipped with suitable protective equipment may intervene.

6.1.2. For emergency responders
Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions
Avoid release to the environment. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up
For containment : Collect spillage.
Methods for cleaning up : Mechanically recover the product. Notify authorities if product enters sewers or public waters.
Other information : Dispose of materials or solid residues at an authorized site.
6.4. Reference to other sections
For further information refer to section 13.

SECTION 7: Handling and storage
7.1. Precautions for safe handling
Precautions for safe handling : Ensure good ventilation of the work station. Wear personal protective equipment. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid contact with skin and eyes. Take all necessary technical measures to avoid or minimize the release of the product on the workplace. Limit quantities of product at the minimum necessary for handling and limit the number of exposed workers. Provide local exhaust or general room ventilation. Floors, walls and other surfaces in the hazard area must be cleaned regularly.

Hygiene measures : Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Separate working clothes from town clothes. Launder separately.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions : Store locked up. Store in a well-ventilated place. Keep cool.

SECTION 8: Exposure controls/personal protection
8.1. Control parameters

<table>
<thead>
<tr>
<th>Material (CAS Number)</th>
<th>ACGIH TWA (mg/m³)</th>
<th>OSHA PEL (TWA) (mg/m³)</th>
<th>IDLH US IDLH (mg/m³)</th>
<th>NIOSH REL (TWA) (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Silver (7440-22-4)</strong></td>
<td>ACGIH TWA (mg/m³)</td>
<td>0.1 mg/m³ (dust and fume)</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>0.01 mg/m³</td>
</tr>
<tr>
<td>Copper (7440-50-8)</td>
<td>ACGIH TWA (mg/m³)</td>
<td>0.2 mg/m³ (fume)</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>0.1 mg/m³ (fume) 1 mg/m³ (dust and mist)</td>
</tr>
<tr>
<td>IDLH US IDLH (mg/m³)</td>
<td>10 mg/m³ (dust)</td>
<td>100 mg/m³ (dust, fume and mist)</td>
<td>NIOSH REL (TWA) (mg/m³)</td>
<td>1 mg/m³ (dust and mist) 0.1 mg/m³ (fume)</td>
</tr>
<tr>
<td>Nickle (7440-02-0)</td>
<td>ACGIH TWA (mg/m³)</td>
<td>1.5 mg/m³ (inhalable particulate matter)</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>1 mg/m³</td>
</tr>
<tr>
<td>IDLH US IDLH (mg/m³)</td>
<td>10 mg/m³</td>
<td>NIOSH REL (TWA) (mg/m³)</td>
<td>0.015 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Zinc (7440-66-6)</td>
<td>ACGIH TWA (mg/m³)</td>
<td>2 mg/m³ (as ZnO)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.2. Appropriate engineering controls
Appropriate engineering controls : Ensure good ventilation of the work station.
Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

**Hand protection:**
Protective gloves

**Eye protection:**
Safety glasses

**Skin and body protection:**
Wear suitable protective clothing

**Respiratory protection:**
In case of inadequate ventilation wear respiratory protection.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>White to light yellow metallic luster, various forms.</td>
</tr>
<tr>
<td>Colour</td>
<td>No data available</td>
</tr>
<tr>
<td>Odour</td>
<td>No data available</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>1435 °F</td>
</tr>
<tr>
<td>Freezing point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Non flammable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity (oral)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Acute toxicity (dermal)</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
Silver (7440-22-4)
- LD50 oral rat: > 5000 mg/kg
- LD50 dermal rat: > 2000 mg/kg

Nickel (7440-02-0)
- LD50 oral rat: > 9000 mg/kg
- LC50 inhalation rat (mg/l): > 10.2 mg/l (Exposure time: 1 h)

Zinc (7440-66-6)
- LD50 oral rat: 630 mg/kg

Silver (7440-22-4)
IARC group: 2B - Possibly carcinogenic to humans
National Toxicity Program (NTP) Status: Reasonably anticipated to be Human Carcinogen
In OSHA Hazard Communication Carcinogen list: Yes

Nickel (7440-02-0)
- STOT-repeated exposure: Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard: Not classified
Viscosity, kinematic: No data available

Symptoms/effects after skin contact: May cause an allergic skin reaction.

SECTION 12: Ecological information
12.1. Toxicity
Ecology - general: Very toxic to aquatic life.

Silver (7440-22-4)
- LC50 fish 1: 0.00155 - 0.00293 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
- EC50 Daphnia 1: 0.00024 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
- LC50 fish 2: 0.0062 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])

Copper (7440-50-8)
- LC50 fish 1: 0.0068 - 0.0156 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
- EC50 Daphnia 1: 0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
- LC50 fish 2: < 0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])

Nickel (7440-02-0)
- LC50 fish 1: > 100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio)
- EC50 Daphnia 1: > 100 mg/l (Exposure time: 48 h - Species: Daphnia magna)
- LC50 fish 2: 1.3 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])
- EC50 Daphnia 2: 1 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

Zinc (7440-66-6)
- LC50 fish 1: 2.16 - 3.05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
- EC50 Daphnia 1: 0.139 - 0.908 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
- LC50 fish 2: 0.211 - 0.269 mg/l (Exposure time: 96 h - Species: Pimephales promelas [semi-static])
12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods
Waste treatment methods: Dispose of contents/container in accordance with licensed collector’s sorting instructions.

SECTION 14: Transport information

Department of Transportation (DOT)
In accordance with DOT
Not applicable

Transportation of Dangerous Goods
Not applicable

Transport by sea
Not applicable

Air transport
Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

<table>
<thead>
<tr>
<th>Substance</th>
<th>Inventory and Reporting Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver (7440-22-4)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory. Subject to reporting requirements of United States SARA Section 313. CERCLA RQ: 1000 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is &gt;100 µm.</td>
</tr>
<tr>
<td>Copper (7440-50-8)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory. Subject to reporting requirements of United States SARA Section 313. CERCLA RQ: 5000 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is &gt;100 µm.</td>
</tr>
<tr>
<td>Nickel (7440-02-0)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory. Subject to reporting requirements of United States SARA Section 313. CERCLA RQ: 100 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is &gt;100 µm.</td>
</tr>
</tbody>
</table>
SILVALOY® 403
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>Zinc (7440-66-6)</th>
<th>Listed on the United States TSCA (Toxic Substances Control Act) inventory</th>
<th>Subject to reporting requirements of United States SARA Section 313</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERCLA RO</td>
<td>454 kg no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is &gt;100 µm</td>
<td></td>
</tr>
</tbody>
</table>

### 15.2. International regulations

- **Silver (7440-22-4)**
  Listed on the TCSI (Taiwan Chemical Substance Inventory)

- **Copper (7440-50-8)**
  Listed on the TCSI (Taiwan Chemical Substance Inventory)

- **Nickel (7440-02-0)**
  Listed on the TCSI (Taiwan Chemical Substance Inventory)

- **Zinc (7440-66-6)**
  Listed on the TCSI (Taiwan Chemical Substance Inventory)

### 15.3. US State regulations

**WARNING:** This product can expose you to Nickel, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

<table>
<thead>
<tr>
<th>Component</th>
<th>Carcinogenicity</th>
<th>Developmental toxicity</th>
<th>Reproductive toxicity male</th>
<th>Reproductive toxicity female</th>
<th>No significant risk level (NSRL)</th>
<th>Maximum allowable dose level (MADL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(7440-02-0)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>State or local regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver(7440-22-4)</td>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td></td>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
<tr>
<td>Copper(7440-50-8)</td>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td></td>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
<tr>
<td>Nickel(7440-02-0)</td>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td></td>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
<tr>
<td>Zinc(7440-66-6)</td>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td></td>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
</tbody>
</table>

**SECTION 16: Other information**

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Full text of H-statements:

- **H317** May cause an allergic skin reaction.
- **H350** May cause cancer.
- **H372** Causes damage to organs through prolonged or repeated exposure.
**Hazard Rating**

**Health**
- 2 Moderate Hazard - Temporary or minor injury may occur
- * - Chronic (long-term) health effects may result from repeated overexposure

**Flammability**
- 1 Slight Hazard - Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 F. (Class IIIB)

**Physical**
- 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

**Personal protection**
- B
- B - Safety glasses, Gloves

---

**NFPA health hazard**
- 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

**NFPA fire hazard**
- 1 - Materials that must be preheated before ignition can occur.

**NFPA reactivity**
- 1 - Materials that in themselves are normally stable but can become unstable at elevated temperatures and pressures.

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Lucas-Milhaupt, Inc.