SECTION 1: Identification

1.1. Identification
Product form : Mixture
Trade name : SILVALOY® 402
Product code : A00000045

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
Specific target organ : H335 - May cause respiratory irritation.
                   Category 3. Respiratory tract irritation
Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements
GHS-US labelling
Hazard pictograms (GHS-US) : !
Signal word (GHS-US) : Warning
Hazard statements (GHS-US) : H335 - May cause respiratory irritation.
                                  P571 - Use only outdoors or in a well-ventilated area.
                                  P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.
                                  P312 - Call a poison center/doctor if you feel unwell.
                                  P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
                                  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>
</tbody>
</table>
SILVALOY® 402
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>(CAS-No.) 7440-66-6</td>
<td>26 - 30</td>
</tr>
<tr>
<td>Tin</td>
<td>(CAS-No.) 7440-31-5</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 : Call a poison center or a doctor if you feel unwell.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Call a poison center or a doctor if you feel unwell.

First-aid measures after skin contact : 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 inhalation : May cause respiratory irritation.

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**


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.

6.3. **Methods and material for containment and cleaning up**

For containment : Collect spillage.

Methods for cleaning up : Mechanically recover the product.

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. Use only outdoors or in a well-ventilated area. Avoid breathing dust/fume/gas/mist/vapours/spray.

Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. **Conditions for safe storage, including any incompatibilities**

Storage conditions : Store in a well-ventilated place. Keep cool. Store locked up. Keep container tightly closed.

04/12/2018 EN (English) 2/7
SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Silver (7440-22-4)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>ACGIH TWA (mg/m³)</td>
</tr>
<tr>
<td>OSHA</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
</tr>
<tr>
<td>IDLH</td>
<td>US IDLH (mg/m³)</td>
</tr>
<tr>
<td>NIOSH</td>
<td>NIOSH REL (TWA) (mg/m³)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Copper (7440-50-8)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>ACGIH TWA (mg/m³)</td>
</tr>
<tr>
<td>OSHA</td>
<td>OSHA PEL (TWA) (mg/m³)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>IDLH</td>
<td>US IDLH (mg/m³)</td>
</tr>
<tr>
<td>NIOSH</td>
<td>NIOSH REL (TWA) (mg/m³)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tin (7440-31-5)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>ACGIH TWA (mg/m³)</td>
</tr>
<tr>
<td>IDLH</td>
<td>US IDLH (mg/m³)</td>
</tr>
<tr>
<td>NIOSH</td>
<td>NIOSH REL (TWA) (mg/m³)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zinc (7440-66-6)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>ACGIH TWA (mg/m³)</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 insufficient ventilation, wear suitable respiratory equipment

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>1310 °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>
</tbody>
</table>
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

Acute toxicity : Not classified

Silver (7440-22-4)
LD50 oral rat : > 5000 mg/kg
LD50 dermal rat : > 2000 mg/kg

Tin (7440-31-5)
LD50 oral rat : 700 mg/kg
ATE US (oral) : 700 mg/kg bodyweight

Zinc (7440-66-6)
LD50 oral rat : 630 mg/kg
Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Not classified
Respiratory or skin sensitisation : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : May cause respiratory irritation.
Specific target organ toxicity (repeated exposure): Not classified

Aspiration hazard: Not classified

Symptoms/effects after inhalation: May cause respiratory irritation.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general: Very toxic to aquatic life.

Silver (7440-22-4)

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>0.00155 - 0.00293 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>0.00024 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])</td>
</tr>
<tr>
<td>LC50 fish 2</td>
<td>0.0062 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])</td>
</tr>
</tbody>
</table>

Copper (7440-50-8)

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>0.0068 - 0.0156 mg/l (Exposure time: 96 h - Species: Pimephales promelas)</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])</td>
</tr>
<tr>
<td>LC50 fish 2</td>
<td>&lt; 0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])</td>
</tr>
</tbody>
</table>

Zinc (7440-66-6)

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>2.16 - 3.05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>0.139 - 0.908 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])</td>
</tr>
<tr>
<td>LC50 fish 2</td>
<td>0.211 - 0.269 mg/l (Exposure time: 96 h - Species: Pimephales promelas [semi-static])</td>
</tr>
</tbody>
</table>

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 (CAS No.)</th>
<th>List on the United States TSCA inventory</th>
<th>Subject to reporting requirements of United States SARA Section 313</th>
<th>CERCLA RQ</th>
<th>Reporting requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver (7440-22-4)</td>
<td>Listed on the United States TSCA inventory</td>
<td>Subject to reporting requirements of United States SARA Section 313</td>
<td>CERCLA RQ</td>
<td>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 inventory</td>
<td>Subject to reporting requirements of United States SARA Section 313</td>
<td>CERCLA RQ</td>
<td>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>Tin (7440-31-5)</td>
<td>Listed on the United States TSCA inventory</td>
<td>Subject to reporting requirements of United States SARA Section 313</td>
<td>CERCLA RQ</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>
</tr>
</tbody>
</table>

15.2. International regulations

<table>
<thead>
<tr>
<th>Substance (CAS No.)</th>
<th>List on TCSI (Taiwan Chemical Substance Inventory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver (7440-22-4)</td>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
</tr>
<tr>
<td>Copper (7440-50-8)</td>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
</tr>
<tr>
<td>Tin (7440-31-5)</td>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
</tr>
<tr>
<td>Zinc (7440-66-6)</td>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
</tr>
</tbody>
</table>

15.3. US State regulations

<table>
<thead>
<tr>
<th>Substance (CAS No.)</th>
<th>US State Right To Know Lists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver (7440-22-4)</td>
<td>U.S. - Massachusetts - 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>Tin (7440-31-5)</td>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
</tbody>
</table>
Zinc (7440-66-6)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Revision date: 02/08/2018

Full text of H-statements:

| H335 | May cause respiratory irritation. |

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.

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

SDS US (GHS HazCom 2012)

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