SECTION 1: Identification

1.1. Identification

Product form: Mixture
Trade name: SILVALOY® 495
Product code: A00000043

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

<table>
<thead>
<tr>
<th>Skin sensitisation, category 1B</th>
<th>H317</th>
<th>May cause an allergic skin reaction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogenicity, Category 2</td>
<td>H351</td>
<td>Suspected of causing cancer.</td>
</tr>
<tr>
<td>Specific target organ toxicity — Single exposure, Category 3, Narcosis</td>
<td>H366</td>
<td>May cause drowsiness or dizziness.</td>
</tr>
<tr>
<td>Specific target organ toxicity — Repeated exposure, Category 2</td>
<td>H373</td>
<td>May cause damage to organs through prolonged or repeated exposure.</td>
</tr>
</tbody>
</table>

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): H317 - May cause an allergic skin reaction.
H336 - May cause drowsiness or dizziness.
H351 - Suspected of causing cancer.
H373 - May cause 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.
P271 - Use only outdoors or in a well-ventilated area.
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.
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P312 - Call a poison center/doctor if you feel unwell.
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.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
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>48 - 50</td>
</tr>
<tr>
<td>Zinc</td>
<td>(CAS-No.) 7440-66-6</td>
<td>21 - 25</td>
</tr>
<tr>
<td>Copper</td>
<td>(CAS-No.) 7440-50-8</td>
<td>15 - 17</td>
</tr>
<tr>
<td>Manganese</td>
<td>(CAS-No.) 7439-96-5</td>
<td>6.5 - 8.5</td>
</tr>
<tr>
<td>Nickel</td>
<td>(CAS-No.) 7440-02-0</td>
<td>4 - 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 : May cause drowsiness or dizziness.
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 : Ventilate spillage area. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid contact with skin and eyes.

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. 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:
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. Use only outdoors or in a well-ventilated area.

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.

7.2. Conditions for safe storage, including any incompatibilities

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>ACGIH TWA (mg/m³)</th>
<th>OSHA PEL (TWA) (mg/m³)</th>
<th>US IDLH (mg/m³)</th>
<th>NIOSH REL (TWA) (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver (7440-22-4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACGIH</td>
<td>0.1 mg/m³ (dust and fume)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSHA</td>
<td>0.01 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDLH</td>
<td>10 mg/m³ (dust)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIOSH</td>
<td>0.01 mg/m³ (dust)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper (7440-50-8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACGIH</td>
<td>0.2 mg/m³ (fume)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSHA</td>
<td>0.1 mg/m³ (fume)</td>
<td>1 mg/m³ (dust and mist)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDLH</td>
<td>100 mg/m³ (dust, fume and mist)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIOSH</td>
<td>1 mg/m³ (dust and mist)</td>
<td>0.1 mg/m³ (fume)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manganese (7439-96-5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACGIH</td>
<td>0.02 mg/m³ (respirable particulate matter)</td>
<td>0.1 mg/m³ (inhalable particulate matter)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSHA</td>
<td>5 mg/m³ (fume)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDLH</td>
<td>500 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIOSH</td>
<td>1 mg/m³ (fume)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NIOSH</td>
<td>3 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel (7440-02-0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACGIH</td>
<td>1.5 mg/m³ (inhalable particulate matter)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSHA</td>
<td>1 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDLH</td>
<td>10 mg/m³</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>NIOSH</td>
<td>0.015 mg/m³</td>
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<td></td>
</tr>
<tr>
<td>Zinc (7440-66-6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACGIH</td>
<td>2 mg/m³ (as ZnO)</td>
<td></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 insufficient ventilation, wear suitable respiratory equipment

### SECTION 9: Physical and chemical properties

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

- **Physical state:** Solid
- **Appearance:** White to light yellow metallic luster, various forms.
- **Colour:** No data available
- **Odour:** No data available
- **Odour threshold:** No data available
- **pH:** No data available
- **Melting point:** 1290 °F
- **Freezing point:** Not applicable
- **Boiling point:** No data available
- **Flash point:** Not applicable
- **Relative evaporation rate (butylacetate=1):** No data available
- **Flammability (solid, gas):** Non flammable.
- **Vapour pressure:** No data available
- **Relative vapour density at 20 °C:** No data available
- **Relative density:** Not applicable
- **Solubility:** No data available
- **Log Pow:** No data available
- **Auto-ignition temperature:** Not applicable
- **Decomposition temperature:** No data available
- **Viscosity, kinematic:** No data available
- **Viscosity, dynamic:** No data available
- **Explosive limits:** Not applicable
- **Explosive properties:** No data available
- **Oxidising properties:** No data available

#### 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

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 (oral)**: Not classified
- **Acute toxicity (dermal)**: Not classified
- **Acute toxicity (inhalation)**: Not classified

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

**Manganese (7439-96-5)**
- LD50 oral rat: 9 g/kg
- ATE US (oral): 9000 mg/kg bodyweight

**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)**
- Skin corrosion/irritation: Not classified
- Serious eye damage/irritation: Not classified
- Respiratory or skin sensitisation: May cause an allergic skin reaction.
- Germ cell mutagenicity: Not classified
- Carcinogenicity: Suspected of causing cancer.

**Nickel (7440-02-0)**
- 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

- Reproductive toxicity: Not classified
- STOT-single exposure: May cause drowsiness or dizziness.
- STOT-repeated exposure: May cause damage to organs through prolonged or repeated exposure.

**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: May cause drowsiness or dizziness.
- 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])
### 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

<table>
<thead>
<tr>
<th>Waste treatment methods</th>
<th>Disposal of contents/container in accordance with licensed collector’s sorting instructions.</th>
</tr>
</thead>
</table>

### 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
### SILVALOY® 495

**Safety Data Sheet**

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

---

<table>
<thead>
<tr>
<th><strong>Silver (7440-22-4)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
<td></td>
</tr>
<tr>
<td>Subject to reporting requirements of United States SARA Section 313</td>
<td></td>
</tr>
<tr>
<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>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Copper (7440-50-8)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
<td></td>
</tr>
<tr>
<td>Subject to reporting requirements of United States SARA Section 313</td>
<td></td>
</tr>
<tr>
<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>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Manganese (7439-96-5)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
<td></td>
</tr>
<tr>
<td>Subject to reporting requirements of United States SARA Section 313</td>
<td></td>
</tr>
<tr>
<td>CERCLA RQ</td>
<td>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>

<table>
<thead>
<tr>
<th><strong>Zinc (7440-66-6)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
<td></td>
</tr>
<tr>
<td>Subject to reporting requirements of United States SARA Section 313</td>
<td></td>
</tr>
<tr>
<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><strong>Silver (7440-22-4)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Copper (7440-50-8)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th><strong>Manganese (7439-96-5)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Nickel (7440-02-0)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Zinc (7440-66-6)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the TCSI (Taiwan Chemical Substance Inventory)</td>
<td></td>
</tr>
</tbody>
</table>

#### 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>
</table>
| Silver(7440-22-4) | 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 |
Component | State or local regulations
--- | ---
**Copper (7440-50-8)** | 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

**Manganese (7439-96-5)** | 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

**Nickel (7440-02-0)** | 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

**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

Full text of H-statements:

| H317 | May cause an allergic skin reaction. |
| H336 | May cause drowsiness or dizziness. |
| H351 | Suspected of causing cancer. |
| H373 | May cause damage to organs through prolonged or repeated exposure. |

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: 0 - Material that in themselves are normally stable, even under fire conditions.

### 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**

0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

**Personal protection**

B

- Safety glasses, Gloves

**SDS US (GHS HazCom 2012)**

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

Lucas-Milhaupt, Inc.