1 Identification

Trade name: R276 Lead (Pb) Solder Paste (Sn62Pb36Ag2, Sn10Pb88Ag2, Sn43Pb43Bi14)

Relevant identified uses of the substance or mixture and uses advised against

No further relevant information available.

Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Kester Inc.
800 West Thorndale Avenue
Itasca, IL 60143 USA
Tel (630) 616-4000
Tel International  00 1 630 616-4000

ITW Specialty Materials (Suzhou) Co., Ltd.
Heng Qiao Road
Wujian Economic Development Zone
Suzhou, Jiangsu 215200 China
Tel +86 512 82060808

Kester GmbH
Ganghofer Strasse 45
D-82216 Germindlen Germany
Tel +49 (0) 8142 4785 0

Information department: Product Compliance: EHS_Kester@kester.com

Emergency telephone number: 
CHEMTREC 24-Hour Emergency Response  Telephone Number : (800) 424-9300
CHEMTREC 24-Hour Emergency Response (Outside US & Canada)  Telephone Number : (703) 527-3887

2 Hazard(s) identification

Classification of the substance or mixture

Health hazard

Carc. 2  H351  Suspected of causing cancer.
Repr. 1  H360  May damage fertility or the unborn child.
STOT RE 2  H373  May cause damage to organs through prolonged or repeated exposure.

Acute Tox. 4  H302  Harmful if swallowed.
Acute Tox. 4  H332  Harmful if inhaled.

Label elements

GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).

Hazard pictograms

GHS07  GHS08

Signal word Danger

(Contd. on page 2)
### Hazard-determining components of labeling:
**LEAD (Pb)**

**Hazard statements**
- H302+H332: Harmful if swallowed or if inhaled.
- H351: Suspected of causing cancer.
- H360: May damage fertility or the unborn child.
- H373: May cause damage to organs through prolonged or repeated exposure.

**Precautionary statements**
- P260: Do not breathe dust/fume/gas/mist/vapors/spray.
- P264: Wash thoroughly after handling.
- P270: Do not eat, drink or smoke when using this product.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P301+P312: If swallowed: Call a poison center/doctor if you feel unwell.
- P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P308+P313: IF exposed or concerned: Get medical advice/attention.
- P405: Store locked up.
- P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

### Classification system:
**NFPA ratings (scale 0 - 4)**
- Health: 2
- Fire: 0
- Reactivity: 0

**HMIS-ratings (scale 0 - 4)**
- Health: *1
- Fire: 0
- Reactivity: 0

### Other hazards
**Results of PBT and vPvB assessment**
- **PBT**: Not applicable.
- **vPvB**: Not applicable.

### 3 Composition/information on ingredients
**Description**: Mixture of the substances listed below with nonhazardous additions.

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Description</th>
<th>% Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 7440-31-5</td>
<td>TIN (Sn)</td>
<td>5-85%</td>
</tr>
<tr>
<td>CAS: 7439-92-1</td>
<td>LEAD (Pb)</td>
<td>25-95%</td>
</tr>
<tr>
<td>CAS: 7440-22-4</td>
<td>SILVER (Ag)</td>
<td>0-5%</td>
</tr>
<tr>
<td>CAS: 872-50-4</td>
<td>N-methyl-2-pyrrolidone</td>
<td>≥0.1-51%</td>
</tr>
</tbody>
</table>

**SVHC**
- CAS: 872-50-4 | N-methyl-2-pyrrolidone  |
4 First-aid measures

Description of first aid measures
General information:
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
Follow general first aid procedures.
After inhalation: Supply fresh air; consult doctor in case of complaints.
After skin contact: Immediately wash with water and soap and rinse thoroughly.
After eye contact: Rinse opened eye for several minutes under running water.
After swallowing: Seek immediate medical advice.
Information for doctor:
Most important symptoms and effects, both acute and delayed No further relevant information available.
Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents:
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Special hazards arising from the substance or mixture In case of fire, the following can be released:
Advice for firefighters
Protective equipment: No special measures required.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures Ensure adequate ventilation
Environmental precautions: Do not allow to enter sewers/surface or ground water.
Methods and material for containment and cleaning up:
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Reference to other sections
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
Protective Action Criteria for Chemicals

<table>
<thead>
<tr>
<th>PAC-1:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 7440-31-5</td>
<td>TIN (Sn)</td>
<td>6 mg/m³</td>
<td></td>
</tr>
<tr>
<td>CAS: 7439-92-1</td>
<td>LEAD (Pb)</td>
<td>0.15 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BISMUTH (Bi)</td>
<td>15 mg/m³</td>
<td></td>
</tr>
<tr>
<td>CAS: 7440-22-4</td>
<td>SILVER (Ag)</td>
<td>0.3 mg/m³</td>
<td></td>
</tr>
<tr>
<td>CAS: 872-50-4</td>
<td>N-methyl-2-pyrrolidone</td>
<td>30 ppm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 7440-31-5</td>
<td>TIN (Sn)</td>
<td>67 mg/m³</td>
<td></td>
</tr>
<tr>
<td>CAS: 7439-92-1</td>
<td>LEAD (Pb)</td>
<td>120 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BISMUTH (Bi)</td>
<td>170 mg/m³</td>
<td></td>
</tr>
<tr>
<td>CAS: 7440-22-4</td>
<td>SILVER (Ag)</td>
<td>170 mg/m³</td>
<td></td>
</tr>
<tr>
<td>CAS: 872-50-4</td>
<td>N-methyl-2-pyrrolidone</td>
<td>32 ppm</td>
<td></td>
</tr>
</tbody>
</table>
7 Handling and storage

Handling:
Precautions for safe handling: Thorough dusting.
Information about protection against explosions and fires: No special measures required.

Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: Store in a cool location.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: Keep receptacle tightly sealed.
Specific end use(s): No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems: No further data; see item 7.

Control parameters
Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>CAS: 7440-31-5 TIN (Sn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL Long-term value: 2 mg/m³ metal</td>
</tr>
<tr>
<td>REL Long-term value: 2 mg/m³</td>
</tr>
<tr>
<td>TLV Long-term value: 2 mg/m³ metal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS: 7439-92-1 LEAD (Pb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL Long-term value: 0.05* mg/m³</td>
</tr>
<tr>
<td>REL Long-term value: 0.05* mg/m³</td>
</tr>
<tr>
<td>TLV Long-term value: 0.05* mg/m³ and inorganic compounds as Pb; BEI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS: 7440-22-4 SILVER (Ag)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL Long-term value: 0.01 mg/m³</td>
</tr>
<tr>
<td>REL Long-term value: 0.01 mg/m³</td>
</tr>
<tr>
<td>TLV Long-term value: 0.1 mg/m³ metal: dust and fume</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAS: 872-50-4 N-methyl-2-pyrrolidone</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEEL Long-term value: 10 ppm Skin</td>
</tr>
</tbody>
</table>

Additional information:
PEL = Permissible Exposure Limit (OSHA)
TLV = Threshold Limit Value (ACGIH)
OSHA = Occupational Safety and Health Administration
ACGIH = American Conference of Governmental Industrial Hygienists

Exposure controls
Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.

Breathing equipment:
Not necessary if room is well-ventilated.
Use suitable respiratory protective device in case of insufficient ventilation.

Protection of hands:

Protective gloves

Material of gloves:
Nitrile rubber, NBR
Natural rubber, NR

Penetration time of glove material:
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye protection:

Safety glasses

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:
Form: Paste
Color: Silver grey
Odor: Mild

pH-value: Not applicable.

Change in condition
Melting point/Melting range: Undetermined.
Boiling point/Boiling range: 274 °C (525.2 °F)

Flash point: Not applicable.

Flammability (solid, gaseous): Not determined.

Auto igniting: Product is not selfigniting.

Danger of explosion: Product does not present an explosion hazard.

Vapor pressure at 970 °C (1,778 °F): 1.3 hPa (1 mm Hg)

Density: Not determined.
Trade name: R276 Lead (Pb) Solder Paste (Sn62Pb36Ag2, Sn10Pb88Ag2, Sn43Pb43Bi14)

Vapor density
Not applicable.

Solubility in / Miscibility with
Water: Insoluble.

Solvent content:
Organic solvents: 4.2 %
Solids content: 94.5 %

10 Stability and reactivity

Reactivity No further relevant information available.
Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
Possibility of hazardous reactions No dangerous reactions known.
Conditions to avoid No further relevant information available.
Incompatible materials: No further relevant information available.
Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

Information on toxicological effects
Acute toxicity:

LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>CAS: 7439-92-1 LEAD (Pb)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>LD50 500 mg/kg (ATE)</td>
</tr>
<tr>
<td>Inhalative</td>
<td>LC50/4 h 1.5 mg/l (ATE)</td>
</tr>
</tbody>
</table>

Primary irritant effect:
on the skin: No irritant effect.
on the eye: Irritating effect.
Sensitization:
Sensitization possible through inhalation.
Sensitization possible through skin contact.
Additional toxicological information:
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

Carcinogenic categories
IARC (International Agency for Research on Cancer)

<table>
<thead>
<tr>
<th>CAS: 7439-92-1 LEAD (Pb)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2B</td>
</tr>
</tbody>
</table>

NTP (National Toxicology Program)

<table>
<thead>
<tr>
<th>CAS: 7439-92-1 LEAD (Pb)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
</tr>
</tbody>
</table>

OSHA-Ca (Occupational Safety & Health Administration)

None of the ingredients is listed.

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
**Trade name:** R276 Lead (Pb) Solder Paste (Sn62Pb36Ag2, Sn10Pb88Ag2, Sn43Pb43Bi14)

**Additional ecological information:**
**General notes:**
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

**Results of PBT and vPvB assessment**
- PBT: Not applicable.
- vPvB: Not applicable.

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**13 Disposal considerations**

**Waste treatment methods**
**Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

**Uncleaned packagings:**
**Recommendation:** Disposal must be made according to official regulations.

---

**14 Transport information**

<table>
<thead>
<tr>
<th>UN-Number</th>
<th>DOT, ADR, ADN, IMDG, IATA</th>
<th>UN proper shipping name</th>
<th>DOT, ADR, ADN, IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not applicable</td>
<td></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport hazard class(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT, ADR, ADN, IMDG, IATA</td>
</tr>
<tr>
<td>Class</td>
</tr>
<tr>
<td>Packing group</td>
</tr>
<tr>
<td>DOT, IMDG, IATA</td>
</tr>
<tr>
<td>Special precautions for user</td>
</tr>
<tr>
<td>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</td>
</tr>
<tr>
<td>UN &quot;Model Regulation&quot;</td>
</tr>
<tr>
<td>Not applicable</td>
</tr>
</tbody>
</table>

---

**15 Regulatory information**

**Safety, health and environmental regulations/legislation specific for the substance or mixture**
All ingredients are listed on the following Government Inventories:
- China: Inventory of Existing Chemical Substances in China (IECSC)
- Korea: Korea Existing Chemicals List (ECL)
- Europe: European Inventory of Existing Commercial Chemical Substances (EINECS)
- Japan: Inventory of Existing and New Chemical Substances (ENCS)
- Philippines: Philippine Inventory of Chemicals and Chemical Substances (PICCS)
- USA: TSCA (Toxic Substances Control Act) TSCA Inventory of Chemical Substances

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USA The following information relates to product regulation specific to the USA.

**SARA (Superfund Amendments and Reauthorization Act)**

**Section 355 (extremely hazardous substances):**
None of the ingredient is listed.

**Section 313 (Specific toxic chemical listings):**
CAS: 7439-92-1 LEAD (Pb)

(Contd. on page 8)
Safety Data Sheet
acc. to OSHA HCS 29CFR1910.1200

Trade name: R276 Lead (Pb) Solder Paste (Sn62Pb36Ag2, Sn10Pb88Ag2, Sn43Pb43Bi14)

### CAS numbers
- **CAS: 7440-22-4** SILVER (Ag)
- **CAS: 872-50-4** N-methyl-2-pyrrolidone

### TSCA new (21st Century Act) (Substances not listed)

### California Proposition 65
- **Chemicals known to cause cancer:**
  - LEAD (Pb)
- **Chemicals known to cause reproductive toxicity:**
  - LEAD (Pb)
  - N-methyl-2-pyrrolidone

### Carcinogenic categories

### EPA (Environmental Protection Agency)
- **CAS: 7439-92-1** LEAD (Pb) [B2]
- **CAS: 7440-22-4** SILVER (Ag) [D]

### NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients is listed.

### CANADA:
Workplace Hazardous Materials Identification (WHMIS):
This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR) and the Safety Data Sheet (SDS) contains all of the information required by the CPR.

### GHS label elements
The product is classified and labeled according to the Globally Harmonized System (GHS).

### Hazard pictograms
- GHS07
- GHS08

### Signal word
Danger

### Hazard-determining components of labeling:
- **LEAD (Pb)**

### Hazard statements
- **H302+H332** Harmful if swallowed or if inhaled.
- **H351** Suspected of causing cancer.
- **H360** May damage fertility or the unborn child.
- **H373** May cause damage to organs through prolonged or repeated exposure.

### Precautionary statements
- **P260** Do not breathe dust/fume/gas/mist/vapors/spray.
- **P264** Wash thoroughly after handling.
- **P270** Do not eat, drink or smoke when using this product.
- **P280** Wear protective gloves/protective clothing/eye protection/face protection.
- **P301+P312** If swallowed: Call a poison center/docotor if you feel unwell.
- **P304+P340** IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- **P308+P313** IF exposed or concerned: Get medical advice/attention.
- **P405** Store locked up.
- **P501** Dispose of contents/container in accordance with local/regional/national/international regulations.

### Other regulations, limitations and prohibitive regulations

### Substances of very high concern (SVHC) according to REACH, Article 57
- **CAS: 872-50-4** N-methyl-2-pyrrolidone

(Contd. of page 7)

(Contd. on page 9)
16 Other information

The information contained herein is based on data considered accurate and is offered solely for information, consideration and investigation. Kester extends no warranties, makes no representations and assumes no responsibility as to the accuracy, completeness or suitability of this data for any purchaser’s use. The data on this Material Safety Data Sheet relates only to this product and does not relate to use with any other material or in any process. All chemical products should be used only by, or under the direction of, technically qualified personnel who are aware of the hazards involved and the necessity for reasonable care in handling. Hazard communication regulations require that employees must be trained on how to use a Material Safety Data Sheet as a source for hazard information.

Department issuing Safety Data Sheet (SDS): Product Compliance / EHS Department
Contact: EHS_Kester@kester.com

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 4: Flammable liquids – Category 4
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Carc. 2: Carcinogenicity – Category 2
Carc. 2: Carcinogenicity – Category 2
Repr. 1: Reproductive toxicity – Category 1
Repr. 1B: Reproductive toxicity – Category 1B
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2

* Data compared to the previous version altered.