1 Identification

Trade name: HM531 Solder Paste Lead (Pb) Alloy
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 Thormdale 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
Wujiang Economic Development Zone
Suzhou, Jiangsu 215200 China
Tel +86 512 82060808

Kester GmbH
Ganghofer Strasse 45
D-82216 Gerolzhofen 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.
Eye Irrit. 2A H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.

Label elements

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

(Contd. on page 2)
Safety Data Sheet
acc. to OSHA HCS 29CFR1910.1200

Printing Date 08/22/2017 Version number 8 Reviewed on 08/22/2017

Trade name: HM531 Solder Paste Lead (Pb) Alloy

(Contd. of page 1)

Hazard pictograms

GHS07  GHS08

Signal word Danger

Hazard-determining components of labeling:
LEAD (Pb)
modified rosin

Hazard statements
H302+H332 Harmful if swallowed or if inhaled.
H319  Causes serious eye irritation.
H317  May cause an allergic skin reaction.
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.
P302+P352 IF ON SKIN: Wash with plenty of water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
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)

2 0
Health = 2
Fire = 0
Reactivity = 0

HMIS-ratings (scale 0 - 4)

HEALTH 1
Health = *1

FIRE 0
Fire = 0

REACTIVITY 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>40-70%</td>
</tr>
</tbody>
</table>

(Contd. on page 3)
Trade name: HM531 Solder Paste Lead (Pb) Alloy

CAS: 7439-92-1 | LEAD (Pb) | Carc. 2, H351; Repr. 1B, H360; STOT RE 2, H373 | Acute Tox. 4, H302; Acute Tox. 4, H332 | 25-40%
--- | --- | --- | --- | ---
CAS: 61790-85-0 | Ethoxylated Amines | Eye Dam. 1, H318 | 1-3%
--- | --- | --- | --- | ---
CAS: 7440-22-4 | SILVER (Ag) | Skin Irrit. 2, H315 | 0-3%
--- | --- | --- | --- | ---
Trade Secret | Organic Acid | Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335 | 1-3%
--- | --- | --- | --- | ---
Trade Secret | modified rosin | Skin Sens. 1, H317 | 1-3%
--- | --- | --- | --- | ---
CAS: 111-42-2 | diethanolamine | Carc. 2, H351; STOT RE 2, H373 | Skin Corr. 1B, H314; Eye Dam. 1, H318 | Acute Tox. 4, H302 | ≥0.1-≤1%

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:
In case of unconsciousness place patient stably in side position for transportation. 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.

(Contd. on page 4)
Trade name: HM531 Solder Paste Lead (Pb) Alloy

### Protective Action Criteria for Chemicals

<table>
<thead>
<tr>
<th>PAC-1:</th>
<th>CAS: 7440-31-5 TIN (Sn)</th>
<th>6 mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAS: 7439-92-1 LEAD (Pb)</td>
<td>0.15 mg/m³</td>
</tr>
<tr>
<td></td>
<td>CAS: 7440-22-4 SILVER (Ag)</td>
<td>0.3 mg/m³</td>
</tr>
<tr>
<td>Proprietary Amine</td>
<td>diethanolamine</td>
<td>34 mg/m³</td>
</tr>
<tr>
<td></td>
<td>CAS: 111-42-2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2:</th>
<th>CAS: 7440-31-5 TIN (Sn)</th>
<th>67 mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAS: 7439-92-1 LEAD (Pb)</td>
<td>120 mg/m³</td>
</tr>
<tr>
<td></td>
<td>CAS: 7440-22-4 SILVER (Ag)</td>
<td>170 mg/m³</td>
</tr>
<tr>
<td>Proprietary Amine</td>
<td>diethanolamine</td>
<td>28 mg/m³</td>
</tr>
<tr>
<td></td>
<td>CAS: 111-42-2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th>CAS: 7440-31-5 TIN (Sn)</th>
<th>400 mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAS: 7439-92-1 LEAD (Pb)</td>
<td>700 mg/m³</td>
</tr>
<tr>
<td></td>
<td>CAS: 7440-22-4 SILVER (Ag)</td>
<td>990 mg/m³</td>
</tr>
<tr>
<td>Proprietary Amine</td>
<td>diethanolamine</td>
<td>130 mg/m³</td>
</tr>
<tr>
<td></td>
<td>CAS: 111-42-2</td>
<td></td>
</tr>
</tbody>
</table>

### 7 Handling and storage

**Handling:**
Precautions for safe handling
Thorough dedusting.
Prevent formation of dust.

**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:
The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
At this time, the other constituents have no known exposure limits.

**CAS: 7440-31-5 TIN (Sn)**

<table>
<thead>
<tr>
<th>PEL</th>
<th>Long-term value: 2 mg/m³ metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL</td>
<td>Long-term value: 2 mg/m³</td>
</tr>
</tbody>
</table>
Safety Data Sheet
acc. to OSHA HCS 29CFR1910.1200

Printing Date 08/22/2017
Reviewed on 08/22/2017

Trade name: HM531 Solder Paste Lead (Pb) Alloy

<table>
<thead>
<tr>
<th>TLV</th>
<th>Long-term value: 2 mg/m³ metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 7439-92-1 LEAD (Pb)</td>
<td></td>
</tr>
<tr>
<td>PEL</td>
<td>Long-term value: 0.05* mg/m³</td>
</tr>
<tr>
<td>*see 29 CFR 1910.1025</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>Long-term value: 0.05* mg/m³</td>
</tr>
<tr>
<td>*8-hr TWA :See PocketGuide App.C</td>
<td></td>
</tr>
<tr>
<td>TLV</td>
<td>Long-term value: 0.05* mg/m³</td>
</tr>
<tr>
<td>*and inorganic compounds, as Pb; BEI</td>
<td></td>
</tr>
<tr>
<td>CAS: 7440-22-4 SILVER (Ag)</td>
<td></td>
</tr>
<tr>
<td>PEL</td>
<td>Long-term value: 0.01 mg/m³</td>
</tr>
<tr>
<td>REL</td>
<td>Long-term value: 0.01 mg/m³</td>
</tr>
<tr>
<td>TLV</td>
<td>Long-term value: 0.1 mg/m³ metal: dust and fume</td>
</tr>
<tr>
<td>CAS: 111-42-2 diethanolamine</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>Long-term value: 15 mg/m³, 3 ppm</td>
</tr>
<tr>
<td>TLV</td>
<td>Long-term value: 1* mg/m³, 0.2* ppm Skin; *inhalable fraction and vapor</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: Pasty
  Color: Silver grey
  Odor: Mild
pH-value: Not applicable.
Change in condition
  Melting point/Melting range: Undetermined.
  Boiling point/Boiling range: 240°C (464 °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): 1.3hPa (1 mm Hg)
Density: Not determined.
Vapor density Not applicable.
Solubility in / Miscibility with
  Water: Insoluble.
Solvent content: Organic solvents: 0.9%

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:
CAS: 7439-92-1 LEAD (Pb)
Oral  LD50  500 mg/kg (ATE)
Inhalative  LC50/4 h  1.5 mg/l (ATE)
Primary irritant effect:
on the skin: No irritant effect.
Trade name: HM531 Solder Paste Lead (Pb) Alloy

(Contd. of page 6)

- **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**

<table>
<thead>
<tr>
<th>IARC (International Agency for Research on Cancer)</th>
<th>NTP (National Toxicology Program)</th>
<th>OSHA-Ca (Occupational Safety &amp; Health Administration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 7439-92-1, LEAD (Pb)</td>
<td>CAS: 102-71-6, 2,2',2''-nitritolriethanol</td>
<td>CAS: 7439-92-1, LEAD (Pb)</td>
</tr>
<tr>
<td>CAS: 111-42-2, diethanolamine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

None of the ingredients is listed.

**12 Ecological information**

- **Toxicity**
  - **Aquatic toxicity**: No further relevant information available.
- **Additional ecological information**
  - **General notes**: Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. Danger to drinking water if even small quantities leak into the ground.
- **Results of PBT and vPvB assessment**
  - **PBT**: Not applicable.
  - **vPvB**: Not applicable.

**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**

- **UN-Number**
  - DOT, ADR, ADN, IMDG, IATA
  - **Not applicable**

- **UN proper shipping name**
  - DOT, ADR, ADN, IMDG, IATA
  - **Not applicable**

- **Transport hazard class(es)**
  - DOT, ADR, ADN, IMDG, IATA
  - **Class**: Not applicable

(Contd. on page 8)
Trade name: HM531 Solder Paste Lead (Pb) Alloy

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

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)
CAS: 7440-22-4 SILVER (Ag)
CAS: 111-42-2 diethanolamine

California Proposition 65

Chemicals known to cause cancer:
LEAD (Pb)
diethanolamine

Chemicals known to cause reproductive toxicity:
LEAD (Pb)

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).

(Contd. of page 7)
Hazard pictograms

GHS07  GHS08

Signal word Danger

Hazard-determining components of labeling:
LEAD (Pb)
modified rosin

Hazard statements
H302+H332 Harmful if swallowed or if inhaled.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H351 Suspected of causing cancer.
H360 May cause damage to 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.
P302+P352 IF ON SKIN: Wash with plenty of water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
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.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

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
vPvB: very Persistent and very Bioaccumulative

(Contd. on page 8)
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Acute Tox. 4: Acute toxicity – Category 4
Skin Corr. 1B: Skin corrosion/irritation – Category 1B
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Skin Sens. 1: Skin sensitisation – Category 1
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.