



## Solder Spheres | Sn5Pb95

### EasySpheres Incorporated

Part Number: 10-0595-XX ( -XX denotes sphere size )

Version No: 1.1

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: 24/01/29

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L.GHS.USA.EN

#### SECTION 1 Identification

##### Product Identifier

|                               |  |
|-------------------------------|--|
| Product name                  | Solder Spheres   Sn5Pb95               |
| Synonyms                      | High Temp. Solder Spheres              |
| Other means of identification | 10-0595-XX ( -XX denotes sphere size ) |

##### Recommended use of the chemical and restrictions on use

|                          |                                 |
|--------------------------|---------------------------------|
| Relevant identified uses | BGA ball replacement and attach |
|--------------------------|---------------------------------|

##### Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

|                         |   |
|-------------------------|---|
| Registered company name | EasySpheres Incorporated  |
| Address                 | 12012 SW Powell Butte Hwy Powell Butte Oregon 97753 United States |
| Telephone               | (858) 486-4068  |
| Fax                     | Not Available   |
| Website                 | <a href="http://www.easyspheres.com">www.easyspheres.com</a>      |
| Email                   | admin@easyspheres.com   |

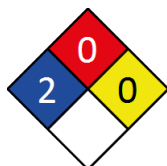
##### Emergency phone number

|                                   |                                     |
|-----------------------------------|-------------------------------------|
| Association / Organisation        | CHEMTREC 24-Hour Emergency Response |
| Emergency telephone numbers       | (800) 424-9300                      |
| Other emergency telephone numbers | 8584864068                          |

#### SECTION 2 Hazard(s) identification

##### Classification of the substance or mixture

NFPA 704 diamond




Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

|                |   |
|----------------|---|
| Classification | Serious Eye Damage/Eye Irritation Category 2A, Reproductive Toxicity Category 1B, Reproductive Toxicity Effects on or via Lactation, Hazardous to the Aquatic Environment Acute Hazard Category 2 |
|----------------|---|

##### Label elements

Solder Spheres | Sn5Pb95

|                     |   |
|---------------------|---|
| Hazard pictogram(s) |  |
|---------------------|---|

|             |        |
|-------------|--------|
| Signal word | Danger |
|-------------|--------|

Hazard statement(s)

|      |   |
|------|---|
| H319 | Causes serious eye irritation.            |
| H360 | May damage fertility or the unborn child. |
| H362 | May cause harm to breast-fed children.    |
| H401 | Toxic to aquatic life.                    |

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

|      |  |
|------|--|
| P201 | Obtain special instructions before use.  |
| P260 | Do not breathe dust/fume.  |
| P263 | Avoid contact during pregnancy/while nursing.                                    |
| P280 | Wear protective gloves, protective clothing, eye protection and face protection. |
| P270 | Do not eat, drink or smoke when using this product.                              |
| P273 | Avoid release to the environment.  |
| P202 | Do not handle until all safety precautions have been read and understood.        |
| P264 | Wash all exposed external body areas thoroughly after handling.                  |

Precautionary statement(s) Response

|                |  |
|----------------|--|
| P308+P313      | IF exposed or concerned: Get medical advice/ attention.  |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P337+P313      | If eye irritation persists: Get medical advice/attention.  |

Precautionary statement(s) Storage

|      |                  |
|------|------------------|
| P405 | Store locked up. |
|------|------------------|

Precautionary statement(s) Disposal

|      |  |
|------|--|
| P501 | Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation. |
|------|--|

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

| CAS No    | %[weight] | Name        |
|-----------|-----------|-------------|
| 7440-31-5 | 10        | <u>tin</u>  |
| 7439-92-1 | 90        | <u>lead</u> |

SECTION 4 First-aid measures

Description of first aid measures

|             |   |
|-------------|---|
| Eye Contact | <p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"><li>▸ Immediately hold eyelids apart and flush the eye continuously with running water.</li><li>▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li><li>▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li></ul> |
|-------------|---|

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|                     |   |
|---------------------|---|
|                     | <ul style="list-style-type: none"> <li>Transport to hospital or doctor without delay.</li> <li>Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> <li><b>DO NOT attempt to remove particles attached to or embedded in eye .</b></li> <li>Lay victim down, on stretcher if available and pad <b>BOTH</b> eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye.</li> <li>Seek urgent medical assistance, or transport to hospital.</li> </ul>  |
| <b>Skin Contact</b> | <p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>Flush skin and hair with running water (and soap if available).</li> <li>Seek medical attention in event of irritation.</li> </ul>  |
| <b>Inhalation</b>   | <ul style="list-style-type: none"> <li>If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>Other measures are usually unnecessary.</li> </ul>   |
| <b>Ingestion</b>    | <ul style="list-style-type: none"> <li><b>IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.</b></li> <li>For advice, contact a Poisons Information Centre or a doctor.</li> <li>Urgent hospital treatment is likely to be needed.</li> <li>In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.</li> <li>If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist.</li> <li>If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS.</li> </ul> <p><b>Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:</b></p> <ul style="list-style-type: none"> <li><b>INDUCE</b> vomiting with fingers down the back of the throat, <b>ONLY IF CONSCIOUS</b>. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> </ul> <p><b>NOTE:</b> Wear a protective glove when inducing vomiting by mechanical means.</p> |

**Most important symptoms and effects, both acute and delayed**

See Section 11

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

- Gastric acids solubilise lead and its salts and lead absorption occurs in the small bowel.
- Particles of less than 1 um diameter are substantially absorbed by the alveoli following inhalation.
- Lead is distributed to the red blood cells and has a half-life of 35 days. It is subsequently redistributed to soft tissue & bone-stores or eliminated. The kidney accounts for 75% of daily lead loss; integumentary and alimentary losses account for the remainder.
- Neurasthenic symptoms are the most common symptoms of intoxication. Lead toxicity produces a classic motor neuropathy. Acute encephalopathy appears infrequently in adults. Diazepam is the best drug for seizures.
- Whole-blood lead is the best measure of recent exposure; free erythrocyte protoporphyrin (FEP) provides the best screening for chronic exposure. Obvious clinical symptoms occur in adults when whole-blood lead exceeds 80 ug/dL.
- British Anti-Lewisite is an effective antidote and enhances faecal and urinary excretion of lead. The onset of action of BAL is about 30 minutes and most of the chelated metal complex is excreted in 4-6 hours, primarily in the bile. Adverse reaction appears in up to 50% of patients given BAL in doses exceeding 5 mg/kg. CaNa2EDTA has also been used alone or in concert with BAL as an antidote. D-penicillamine is the usual oral agent for mobilisation of bone lead; its use in the treatment of lead poisoning remains investigational. 2,3-dimercapto-1-propanesulfonic acid (DMPS) and dimercaptosuccinic acid (DMSA) are water soluble analogues of BAL and their effectiveness is undergoing review. As a rule, stop BAL if lead decreases below 50 ug/dL; stop CaNa2EDTA if blood lead decreases below 40 ug/dL or urinary lead drops below 2 mg/24hrs.

[Ellenhorn &amp; Barceloux: Medical Toxicology]

**BIOLOGICAL EXPOSURE INDEX - BEI**

These represent the determinants observed in specimens collected from a healthy worker who has been exposed at the Exposure Standard (ES or TLV):

| Determinant                     | Index   | Sampling Time          | Comments |
|---------------------------------|---|------------------------|----------|
| 1. Lead in blood                | 30 ug/100 ml                                      | Not Critical           |          |
| 2. Lead in urine                | 150 ug/gm creatinine                              | Not Critical           | B        |
| 3. Zinc protoporphyrin in blood | 250 ug/100 ml erythrocytes OR 100 ug/100 ml blood | After 1 month exposure | B        |

B: Background levels occur in specimens collected from subjects **NOT** exposed.**SECTION 5 Fire-fighting measures****Extinguishing media**

Metal dust fires need to be smothered with sand, inert dry powders.

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### DO NOT USE WATER, CO2 or FOAM.

- Use DRY sand, graphite powder, dry sodium chloride based extinguishers, G-1 or Met L-X to smother fire.
- Confining or smothering material is preferable to applying water as chemical reaction may produce flammable and explosive hydrogen gas.
- Chemical reaction with CO2 may produce flammable and explosive methane.
- If impossible to extinguish, withdraw, protect surroundings and allow fire to burn itself out.
- **DO NOT** use halogenated fire extinguishing agents.

### Special hazards arising from the substrate or mixture

|                      |   |
|----------------------|---|
| Fire Incompatibility | ▸ Reacts with acids producing flammable / explosive hydrogen (H2) gas |
|----------------------|---|

### Special protective equipment and precautions for fire-fighters

|                       |   |
|-----------------------|---|
| Fire Fighting         | <ul style="list-style-type: none"><li>▸ Alert Fire Brigade and tell them location and nature of hazard.</li><li>▸ Wear breathing apparatus plus protective gloves in the event of a fire.</li><li>▸ Prevent, by any means available, spillage from entering drains or water courses.</li><li>▸ Use fire fighting procedures suitable for surrounding area.</li><li>▸ <b>DO NOT</b> approach containers suspected to be hot.</li><li>▸ Cool fire exposed containers with water spray from a protected location.</li><li>▸ If safe to do so, remove containers from path of fire.</li><li>▸ Equipment should be thoroughly decontaminated after use.</li></ul>  |
| Fire/Explosion Hazard | <ul style="list-style-type: none"><li>▸ <b>DO NOT</b> disturb burning dust. Explosion may result if dust is stirred into a cloud, by providing oxygen to a large surface of hot metal.</li><li>▸ <b>DO NOT</b> use water or foam as generation of explosive hydrogen may result.</li></ul> <p>With the exception of the metals that burn in contact with air or water (for example, sodium), masses of combustible metals do not represent unusual fire risks because they have the ability to conduct heat away from hot spots so efficiently that the heat of combustion cannot be maintained - this means that it will require a lot of heat to ignite a mass of combustible metal. Generally, metal fire risks exist when sawdust, machine shavings and other metal 'fines' are present.</p> <p>Metal powders, while generally regarded as non-combustible:</p> <ul style="list-style-type: none"><li>▸ May burn when metal is finely divided and energy input is high.</li><li>▸ May react explosively with water.</li><li>▸ May be ignited by friction, heat, sparks or flame.</li><li>▸ May <b>REIGNITE</b> after fire is extinguished.</li><li>▸ Will burn with intense heat.</li></ul> <p>Note:</p> <ul style="list-style-type: none"><li>▸ Metal dust fires are slow moving but intense and difficult to extinguish.</li><li>▸ Containers may explode on heating.</li><li>▸ Dusts or fumes may form explosive mixtures with air.</li><li>▸ Gases generated in fire may be poisonous, corrosive or irritating.</li><li>▸ Hot or burning metals may react violently upon contact with other materials, such as oxidising agents and extinguishing agents used on fires involving ordinary combustibles or flammable liquids.</li><li>▸ Temperatures produced by burning metals can be higher than temperatures generated by burning flammable liquids</li><li>▸ Some metals can continue to burn in carbon dioxide, nitrogen, water, or steam atmospheres in which ordinary combustibles or flammable liquids would be incapable of burning.</li></ul> <p>Ignites spontaneously in air (pyrophoric) and burns with intense heat.</p> <p>Decomposition may produce toxic fumes of:</p> <p>metal oxides</p> <p>May emit poisonous fumes.</p> <p>May emit corrosive fumes.</p> |

## SECTION 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

|              |   |
|--------------|---|
| Minor Spills | <ul style="list-style-type: none"><li>▸ Clean up waste regularly and abnormal spills immediately.</li><li>▸ Avoid breathing dust and contact with skin and eyes.</li><li>▸ Wear protective clothing, gloves, safety glasses and dust respirator.</li><li>▸ Use dry clean up procedures and avoid generating dust.</li><li>▸ Vacuum up or sweep up. <b>NOTE:</b> Vacuum cleaner must be fitted with an exhaust micro filter (H-Class HEPA type) (consider explosion-proof machines designed to be grounded during storage and use). H-Class HEPA filtered industrial vacuum cleaners should <b>NOT</b> be used on wet materials or surfaces.</li><li>▸ Dampen with water to prevent dusting before sweeping.</li></ul> |
|--------------|---|

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|              |   |
|--------------|---|
|              | <ul style="list-style-type: none"><li>Place in suitable containers for disposal.</li></ul> Environmental hazard - contain spillage.   |
| Major Spills | <p>Environmental hazard - contain spillage.</p> <ul style="list-style-type: none"><li>Do not use compressed air to remove metal dusts from floors, beams or equipment</li><li>Vacuum cleaners, of flame-proof design, should be used to minimise dust accumulation.</li><li>Use non-sparking handling equipment, tools and natural bristle brushes.</li><li>Provide grounding and bonding where necessary to prevent accumulation of static charges during metal dust handling and transfer operations</li><li>Cover and reseal partially empty containers.</li><li>Do not allow chips, fines or dusts to contact water, particularly in enclosed areas.</li></ul> <p>If molten:</p> <ul style="list-style-type: none"><li>Contain the flow using dry sand or salt flux as a dam.</li><li>All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use.</li><li>Allow the spill to cool before remelting scrap.</li></ul> <p>Moderate hazard.</p> <ul style="list-style-type: none"><li><b>CAUTION:</b> Advise personnel in area.</li><li>Alert Emergency Services and tell them location and nature of hazard.</li><li>Control personal contact by wearing protective clothing.</li><li>Prevent, by any means available, spillage from entering drains or water courses.</li><li>Recover product wherever possible.</li><li><b>IF DRY:</b> Use dry clean up procedures and avoid generating dust. Collect residues and place in sealed plastic bags or other containers for disposal. <b>IF WET:</b> Vacuum/shovel up and place in labelled containers for disposal.</li><li><b>ALWAYS:</b> Wash area down with large amounts of water and prevent runoff into drains.</li><li>If contamination of drains or waterways occurs, advise Emergency Services.</li></ul> |

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 Handling and storage

### Precautions for safe handling

|                   |  |
|-------------------|--|
| Safe handling     | <p>For molten metals:</p> <ul style="list-style-type: none"><li>Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops can lead to violent explosions.</li><li>All tooling, containers, molds and ladles, which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use.</li><li>Any surfaces that may contact molten metal (e.g. concrete) should be specially coated</li><li>Drops of molten metal in water (e.g. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen gas to present an explosion hazard. Vigorous circulation of the water and removal of the particles minimise the hazard.</li></ul> <p>During melting operations, the following minimum guidelines should be observed:</p> <ul style="list-style-type: none"><li>Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage.</li><li>Store materials in dry, heated areas with any cracks or cavities pointed downwards.</li><li>Preheat and dry large objects adequately before charging in to a furnace containing molten metal. This is typically done by the use of a drying oven or homogenising furnace. The dry cycle should bring the metal temperature of the coldest item of the batch to 200 degree C (400 deg F) and then hold at that temperature for 6 hours.</li><li>Avoid all personal contact, including inhalation.</li><li>Wear protective clothing when risk of exposure occurs.</li><li>Use in a well-ventilated area.</li><li>Prevent concentration in hollows and sumps.</li><li><b>DO NOT enter confined spaces until atmosphere has been checked.</b></li><li><b>DO NOT allow material to contact humans, exposed food or food utensils.</b></li><li>Avoid contact with incompatible materials.</li><li><b>When handling, DO NOT eat, drink or smoke.</b></li><li>Keep containers securely sealed when not in use.</li><li>Avoid physical damage to containers.</li><li>Always wash hands with soap and water after handling.</li><li>Work clothes should be laundered separately. Launder contaminated clothing before re-use.</li><li>Use good occupational work practice.</li><li>Observe manufacturer's storage and handling recommendations contained within this SDS.</li><li>Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.</li></ul> |
| Other information | <ul style="list-style-type: none"><li>Store in original containers.</li><li>Keep containers securely sealed.</li><li>Store in a cool, dry area protected from environmental extremes.</li></ul>  |

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- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storage and handling recommendations contained within this SDS.

For major quantities:

- Consider storage in banded areas - ensure storage areas are isolated from sources of community water (including stormwater, ground water, lakes and streams).
- Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.

## Conditions for safe storage, including any incompatibilities

| Suitable container      | <ul style="list-style-type: none"> <li>▸ Bulk bags: Reinforced bags required for dense materials.</li> </ul>   |
|-------------------------|--|
| Storage incompatibility | <p>The material is described as an electronegative metal.</p> <p>The activity or electromotive series of metals is a listing of the metals in decreasing order of their reactivity with hydrogen-ion sources such as water and acids. In the reaction with a hydrogen-ion source, the metal is oxidised to a metal ion, and the hydrogen ion is reduced to H<sub>2</sub>. The ordering of the activity series can be related to the standard reduction potential of a metal cation. The more positive the standard reduction potential of the cation, the more difficult it is to oxidise the metal to a hydrated metal cation and the later that metal falls in the series</p> <p>Three notable groups comprise the series</p> <ul style="list-style-type: none"> <li>▸ very electropositive metals</li> <li>▸ electropositive metals</li> <li>▸ electronegative metals</li> </ul> <p>Electronegative metals have electronegativities that fall between 1.9 and 2.5.. Cations of these metals generally have positive standard reduction potentials.</p> <p>They:</p> <ul style="list-style-type: none"> <li>▸ are not oxidised by H<sup>+</sup> (acids)</li> <li>▸ are good oxidising agents</li> <li>▸ oxidise H<sub>2</sub> producing H<sup>+</sup> and depositing the metals from an aqueous solution</li> <li>▸ produce cations that will oxidise more active metals to the cation - the less active metal is deposited as the metal</li> </ul> <p>Electronegative metals are not corroded by oxygen. They are called "noble metals" and are used in coinage and jewelry. Some in this group are slowly oxidised. The oxides formed are not very stable and can be decomposed by heating. Metals in this group can be obtained by thermal decomposition of their oxides. Although non-oxidising acids can't attack electronegative metals, oxidising acids (such as nitric acid) often dissolve them.</p> <p><a href="http://www.wou.edu/las/physci/ch412/activity.htm">http://www.wou.edu/las/physci/ch412/activity.htm</a></p> <ul style="list-style-type: none"> <li>▸ Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.</li> <li>▸ These trifluorides are hypergolic oxidisers. They ignite on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.</li> <li>▸ The state of subdivision may affect the results.</li> <li>▸ Many metals may incandesce, react violently, ignite or react explosively upon addition of concentrated nitric acid.</li> </ul> |



X — Must not be stored together

O — May be stored together with specific precautions

+ — May be stored together

Note: Depending on other risk factors, compatibility assessment based on the table above may not be relevant to storage situations, particularly where large volumes of dangerous goods are stored and handled. Reference should be made to the Safety Data Sheets for each substance or article and risks assessed accordingly.

## SECTION 8 Exposure controls / personal protection

## Control parameters

## Occupational Exposure Limits (OEL)

## INGREDIENT DATA

| Source   | Ingredient | Material name   | TWA                  | STEL          | Peak          | Notes         |
|--|------------|---|----------------------|---------------|---------------|---------------|
| US OSHA Permissible Exposure Limits (PELs) Table Z-1 | tin        | Particulates Not Otherwise Regulated (PNOR)- Total dust | 15 mg/m <sup>3</sup> | Not Available | Not Available | Not Available |
| US OSHA Permissible Exposure Limits (PELs)           | tin        | Particulates Not Otherwise Regulated (PNOR)-            | 5 mg/m <sup>3</sup>  | Not Available | Not Available | Not Available |

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| Source   | Ingredient | Material name  | TWA                 | STEL          | Peak          | Notes   |
|--|------------|--|---------------------|---------------|---------------|---|
| Table Z-1  |            | Respirable fraction  |                     |               |               |   |
| US OSHA Permissible Exposure Limits (PELs) Table Z-3 | tin        | Inert or Nuisance Dust: Total Dust                               | 15 mg/m3 / 50 mppcf | Not Available | Not Available | Not Available   |
| US OSHA Permissible Exposure Limits (PELs) Table Z-3 | tin        | Inert or Nuisance Dust: Respirable fraction                      | 5 mg/m3 / 15 mppcf  | Not Available | Not Available | Not Available   |
| US NIOSH Recommended Exposure Limits (RELs)          | tin        | Tin  | 2 mg/m3             | Not Available | Not Available | [*Note: The REL also applies to other inorganic tin compounds (as Sn) except tin oxides.]       |
| US OSHA Permissible Exposure Limits (PELs) Table Z-1 | lead       | Particulates Not Otherwise Regulated (PNOR)- Respirable fraction | 5 mg/m3             | Not Available | Not Available | Not Available   |
| US OSHA Permissible Exposure Limits (PELs) Table Z-1 | lead       | Particulates Not Otherwise Regulated (PNOR)- Total dust          | 15 mg/m3            | Not Available | Not Available | Not Available   |
| US OSHA Permissible Exposure Limits (PELs) Table Z-3 | lead       | Inert or Nuisance Dust: Total Dust                               | 15 mg/m3 / 50 mppcf | Not Available | Not Available | Not Available   |
| US OSHA Permissible Exposure Limits (PELs) Table Z-3 | lead       | Inert or Nuisance Dust: Respirable fraction                      | 5 mg/m3 / 15 mppcf  | Not Available | Not Available | Not Available   |
| US NIOSH Recommended Exposure Limits (RELs)          | lead       | Lead   | 0.050 mg/m3         | Not Available | Not Available | See Appendix C [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.] |

## Emergency Limits

| Ingredient | TEEL-1     | TEEL-2    | TEEL-3    |
|------------|------------|-----------|-----------|
| tin        | 6 mg/m3    | 67 mg/m3  | 400 mg/m3 |
| lead       | 0.15 mg/m3 | 120 mg/m3 | 700 mg/m3 |

| Ingredient | Original IDLH | Revised IDLH  |
|------------|---------------|---------------|
| tin        | Not Available | Not Available |
| lead       | Not Available | Not Available |

## MATERIAL DATA

The lead concentration in air is to be maintained so that the lead concentration in workers' blood remains below 0.060 mg/100 g of whole blood. The recommended TLV-TWA has been derived following a review of reports of adverse effects on reproduction, blood-pressure and other end-points of toxicity. A particular focus was an assessment of pre-natal blood lead (PbB) levels and post-natal cognitive levels. The fact that lead is a cumulative toxicant which can produce subtle, persistent and apparently permanent effects in the off-spring of lead exposed women is of particular concern. A current view holds that the identification of the PbB levels, that are protective during a working lifetime, is a necessary prerequisite in the recommendation of the TLV because PbB values, rather than workplace air lead concentrations, are more clearly related to adverse health effects.

(see Biological Exposure Index - BEI - in "Advice to Doctor".)

## Exposure controls

|                                  |  |
|----------------------------------|--|
| Appropriate engineering controls | <p>Metal dusts must be collected at the source of generation as they are potentially explosive.</p> <ul style="list-style-type: none"> <li>▸ Avoid ignition sources.</li> <li>▸ Good housekeeping practices must be maintained.</li> <li>▸ Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions.</li> <li>▸ Do not use compressed air to remove settled materials from floors, beams or equipment</li> <li>▸ Vacuum cleaners, of flame-proof design, should be used to minimise dust accumulation.</li> <li>▸ Use non-sparking handling equipment, tools and natural bristle brushes. Cover and reseal partially empty containers. Provide grounding and bonding where necessary to prevent accumulation of static charges during metal dust handling and transfer operations.</li> <li>▸ Do not allow chips, fines or dusts to contact water, particularly in enclosed areas.</li> <li>▸ Metal spraying and blasting should, where possible, be conducted in separate rooms. This minimises the risk of supplying oxygen, in the form of metal oxides, to potentially reactive finely divided metals such as aluminium, zinc, magnesium or titanium.</li> <li>▸ Work-shops designed for metal spraying should possess smooth walls and a minimum of obstructions, such as ledges, on which dust accumulation is possible.</li> <li>▸ Wet scrubbers are preferable to dry dust collectors.</li> </ul> |
|----------------------------------|--|

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- ▶ Bag or filter-type collectors should be sited outside the workrooms and be fitted with explosion relief doors.
- ▶ Cyclones should be protected against entry of moisture as reactive metal dusts are capable of spontaneous combustion in humid or partially wetted states.
- ▶ Local exhaust systems must be designed to provide a minimum capture velocity at the fume source, away from the worker, of 0.5 metre/sec.
- ▶ Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuum and electrostatic precipitators must not be used, unless specifically approved for use with flammable/ explosive dusts.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

|  |                              |
|--|------------------------------|
| Type of Contaminant:   | Air Speed:                   |
| welding, brazing fumes (released at relatively low velocity into moderately still air) | 0.5-1.0 m/s (100-200 f/min.) |

Within each range the appropriate value depends on:

| Lower end of the range                                     | Upper end of the range           |
|--|----------------------------------|
| 1: Room air currents minimal or favourable to capture      | 1: Disturbing room air currents  |
| 2: Contaminants of low toxicity or of nuisance value only. | 2: Contaminants of high toxicity |
| 3: Intermittent, low production.                           | 3: High production, heavy use    |
| 4: Large hood or large air mass in motion                  | 4: Small hood-local control only |

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2.5 m/s (200-500 f/min.) for extraction of gases discharged 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

#### Individual protection measures, such as personal protective equipment



#### Eye and face protection

- ▶ Safety glasses with side shields.
- ▶ Chemical goggles.
- ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

#### Skin protection

See Hand protection below

#### Hands/feet protection

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
  - When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
  - Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.
  - Contaminated gloves should be replaced.
- As defined in ASTM F-739-96 in any application, gloves are rated as:
- Excellent when breakthrough time > 480 min
  - Good when breakthrough time > 20 min
  - Fair when breakthrough time < 20 min

## Solder Spheres | Sn5Pb95

|                         |   |
|-------------------------|---|
|                         | <ul style="list-style-type: none"> <li>· Poor when glove material degrades</li> </ul> <p>For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.</p> <p>It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.</p> <p>Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers technical data should always be taken into account to ensure selection of the most appropriate glove for the task.</p> <p>Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:</p> <ul style="list-style-type: none"> <li>· Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.</li> <li>· Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential</li> </ul> <p>Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.</p> <ul style="list-style-type: none"> <li>▸ Protective gloves eg. Leather gloves or gloves with Leather facing</li> </ul> <p>Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.</p> <ul style="list-style-type: none"> <li>▸ polychloroprene.</li> <li>▸ nitrile rubber.</li> <li>▸ butyl rubber.</li> <li>▸ fluorocautchouc.</li> <li>▸ polyvinyl chloride.</li> </ul> <p>Gloves should be examined for wear and/ or degradation constantly.</p> |
| <b>Body protection</b>  | See Other protection below  |
| <b>Other protection</b> | <ul style="list-style-type: none"> <li>▸ Overalls.</li> <li>▸ P.V.C apron.</li> <li>▸ Barrier cream.</li> <li>▸ Skin cleansing cream.</li> <li>▸ Eye wash unit.</li> </ul>  |

## Respiratory protection

Type -P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

| Required Minimum Protection Factor | Half-Face Respirator | Full-Face Respirator | Powered Air Respirator |
|------------------------------------|----------------------|----------------------|------------------------|
| up to 10 x ES                      | P1<br>Air-line*      | -<br>-               | PAPR-P1<br>-           |
| up to 50 x ES                      | Air-line**           | P2                   | PAPR-P2                |
| up to 100 x ES                     | -                    | P3                   | -                      |
|                                    |                      | Air-line*            | -                      |
| 100+ x ES                          | -                    | Air-line**           | PAPR-P3                |

\* - Negative pressure demand \*\* - Continuous flow

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

Class P2 particulate filters are used for protection against mechanically and thermally generated particulates or both.

P2 is a respiratory filter rating under various international standards, Filters at least 94% of airborne particles

Suitable for:

- Relatively small particles generated by mechanical processes eg. grinding, cutting, sanding, drilling, sawing.
- Sub-micron thermally generated particles e.g. welding fumes, fertilizer and bushfire smoke.
- Biologically active airborne particles under specified infection control applications e.g. viruses, bacteria, COVID-19, SARS

## SECTION 9 Physical and chemical properties

Solder Spheres | Sn5Pb95

## Information on basic physical and chemical properties

|   |               |  |                |
|---|---------------|--|----------------|
| <b>Appearance</b>                                   | Gray          |  |                |
| <b>Physical state</b>                               | Solid         | <b>Relative density (Water = 1)</b>            | Not Available  |
| <b>Odour</b>  | Not Available | <b>Partition coefficient n-octanol / water</b> | Not Available  |
| <b>Odour threshold</b>                              | Not Available | <b>Auto-ignition temperature (°C)</b>          | Not Available  |
| <b>pH (as supplied)</b>                             | Not Available | <b>Decomposition temperature (°C)</b>          | Not Available  |
| <b>Melting point / freezing point (°C)</b>          | Not Available | <b>Viscosity (cSt)</b>                         | Not Available  |
| <b>Initial boiling point and boiling range (°C)</b> | Not Available | <b>Molecular weight (g/mol)</b>                | Not Available  |
| <b>Flash point (°C)</b>                             | Not Available | <b>Taste</b>                                   | Not Available  |
| <b>Evaporation rate</b>                             | Not Available | <b>Explosive properties</b>                    | Not Available  |
| <b>Flammability</b>                                 | Not Available | <b>Oxidising properties</b>                    | Not Available  |
| <b>Upper Explosive Limit (%)</b>                    | Not Available | <b>Surface Tension (dyn/cm or mN/m)</b>        | Not Applicable |
| <b>Lower Explosive Limit (%)</b>                    | Not Available | <b>Volatile Component (%vol)</b>               | Not Available  |
| <b>Vapour pressure (kPa)</b>                        | Not Available | <b>Gas group</b>                               | Not Available  |
| <b>Solubility in water</b>                          | Not Available | <b>pH as a solution (1%)</b>                   | Not Available  |
| <b>Vapour density (Air = 1)</b>                     | Not Available | <b>VOC g/L</b>                                 | Not Available  |

## SECTION 10 Stability and reactivity

|   |  |
|---|--|
| <b>Reactivity</b>                         | See section 7  |
| <b>Chemical stability</b>                 | <ul style="list-style-type: none"> <li>▸ Unstable in the presence of incompatible materials.</li> <li>▸ Product is considered stable.</li> <li>▸ Hazardous polymerisation will not occur.</li> </ul> |
| <b>Possibility of hazardous reactions</b> | See section 7  |
| <b>Conditions to avoid</b>                | See section 7  |
| <b>Incompatible materials</b>             | See section 7  |
| <b>Hazardous decomposition products</b>   | See section 5  |

## SECTION 11 Toxicological information

### Information on toxicological effects

|                     |  |
|---------------------|--|
| <b>Inhaled</b>      | The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.<br>Not normally a hazard due to non-volatile nature of product |
| <b>Ingestion</b>    | Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.  |
| <b>Skin Contact</b> | Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions. Good hygiene practice requires that exposure be kept to a  |

## Solder Spheres | Sn5Pb95

|         |  |
|---------|--|
|         | <p>minimum and that suitable gloves be used in an occupational setting.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>  |
| Eye     | <p>Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals.</p> <p>Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.</p>   |
| Chronic | <p>On the basis, primarily, of animal experiments, concern has been expressed that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment.</p> <p>Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.</p> <p>Serious damage (clear functional disturbance or morphological change which may have toxicological significance) is likely to be caused by repeated or prolonged exposure. As a rule the material produces, or contains a substance which produces severe lesions. Such damage may become apparent following direct application in subchronic (90 day) toxicity studies or following sub-acute (28 day) or chronic (two-year) toxicity tests.</p> <p>There is sufficient evidence to establish a causal relationship between human exposure to the material and impaired fertility</p> <p>Excessive exposure to lead can affect the blood, the nervous system, heart, endocrine organs and the immune system and the digestive system. The synthesis of haemoglobin is inhibited and can result in anaemia. If left untreated, neuromuscular dysfunction, possible paralysis and encephalopathy (brain tissue damage) may result. Other symptoms of overexposure include joint and muscle pain, weakness of the extensor muscles (frequently the hand and wrist), headache, dizziness, abdominal pain, diarrhoea, constipation, nausea, vomiting, blue line on the gums, insomnia and metallic taste. High body levels produce cerebrospinal pressure, brain damage with stupor leading to coma and, in some cases, death. Early symptoms of lead poisoning ("plumbism") include anorexia and loss of weight, constipation, apathy or irritability, occasional vomiting, fatigue, headache, weakness, and a metallic taste in the mouth. Advanced poisonings are characterised by intermittent vomiting, irritability, nervousness, myalgia of the arms and legs (often with wrist and foot drop). Severe poisonings may produce persistent vomiting, ataxia, stupor or lethargy, visual disturbances progressing to optic neuritis and atrophy, hyper-tension, papilloedema, cranial nerve paralysis, delirium, convulsions and coma. Neurological effects include mental retardation, seizures, cerebral palsy and marked muscular contractions that distort the spine, limbs, hips and sometimes the cranial innervated muscles (dystonia musculorum deformans). Industrial exposure has been associated with irreversible kidney damage.</p> <p>Lead is a cumulative poison with adverse effects in pregnancy [NIOSH/TIC]</p> <p>Lead salts have been reported to cross the placenta and induce embryo- and foeto-mortality. They also may have a teratogenic effect (causing birth deformities) in certain animal species. Organometallic lead may not produce these effects. Adverse effects of lead on human reproduction, embryonic and foetal development and postnatal mental development have also been recorded. Foetal exposure to lead may result in birth defects, mental retardation, behavioural disorders and death during the first year of childhood. Paternal effects may include reduced sex drive, impotence, sterility and adverse effects on the sperm which in turn may increase the potential for increased birth defects. Maternal effects may include miscarriage and stillbirth in exposed women, or women whose husbands might be exposed, sterility or decreased fertility, and abnormal menses. Exposure by both parents to lead may exacerbate the reproductive effects.</p> |

| Solder Spheres   Sn5Pb95 | TOXICITY  | IRRITATION   |
|--------------------------|---|--|
|                          | Not Available   | Not Available  |
| tin                      | TOXICITY  | IRRITATION   |
|                          | dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>   | Eye: no adverse effect observed (not irritating) <sup>[1]</sup>  |
|                          | Inhalation(Rat) LC50: >4.75 mg/l4h <sup>[1]</sup>   | Skin: no adverse effect observed (not irritating) <sup>[1]</sup> |
|                          | Oral (Rat) LD50: >2000 mg/kg <sup>[1]</sup>   |  |
| lead                     | TOXICITY  | IRRITATION   |
|                          | dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>   | Not Available  |
|                          | Inhalation(Rat) LC50: >5.05 mg/l4h <sup>[1]</sup>   |  |
|                          | Oral (Rat) LD50: >2000 mg/kg <sup>[1]</sup>   |  |
| <b>Legend:</b>           | 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances |  |

|                          |  |
|--------------------------|--|
| Solder Spheres   Sn5Pb95 | Exposure to the material may result in a possible risk of irreversible effects. The material may produce mutagenic effects in man. This concern is raised, generally, on the basis of appropriate studies using mammalian somatic cells in vivo. Such findings are often supported by positive results from in vitro mutagenicity studies. |
| TIN                      | No significant acute toxicological data identified in literature search.   |

Solder Spheres | Sn5Pb95

|                                   |  |                          |   |  |
|-----------------------------------|--|--------------------------|---|--|
| LEAD                              | WARNING: Lead is a cumulative poison and has the potential to cause abortion and intellectual impairment to unborn children of pregnant workers. |                          |   |  |
| Acute Toxicity                    | ✗  | Carcinogenicity          | ✗ |  |
| Skin Irritation/Corrosion         | ✗  | Reproductivity           | ✓ |  |
| Serious Eye Damage/Irritation     | ✓  | STOT - Single Exposure   | ✗ |  |
| Respiratory or Skin sensitisation | ✗  | STOT - Repeated Exposure | ✗ |  |
| Mutagenicity                      | ✗  | Aspiration Hazard        | ✗ |  |

Legend: ✗ – Data either not available or does not fill the criteria for classification  
✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

|                          |  |                    |                               |                 |               |
|--------------------------|--|--------------------|-------------------------------|-----------------|---------------|
| Solder Spheres   Sn5Pb95 | Endpoint   | Test Duration (hr) | Species                       | Value           | Source        |
|                          | Not Available  | Not Available      | Not Available                 | Not Available   | Not Available |
| tin                      | Endpoint   | Test Duration (hr) | Species                       | Value           | Source        |
|                          | NOEC(ECx)  | 168h               | Crustacea                     | <0.005mg/l      | 2             |
|                          | EC50   | 72h                | Algae or other aquatic plants | >0.0192mg/l     | 2             |
|                          | LC50   | 96h                | Fish                          | >0.0124mg/l     | 2             |
| lead                     | Endpoint   | Test Duration (hr) | Species                       | Value           | Source        |
|                          | NOEC(ECx)  | 672h               | Fish                          | 0.00003mg/l     | 4             |
|                          | EC50   | 96h                | Algae or other aquatic plants | 0.282-0.864mg/l | 4             |
|                          | EC50   | 72h                | Algae or other aquatic plants | 0.0205mg/l      | 2             |
|                          | LC50   | 96h                | Fish                          | 0.0079mg/l      | 2             |
|                          | EC50   | 48h                | Crustacea                     | 0.029mg/l       | 2             |
| Legend:                  | Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data |                    |                               |                 |               |

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

For Metal:

Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.

Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities.

Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. A significant proportion of dissolved/ sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal ions can then be taken up by aquatic organisms. Ionic species may bind to dissolved ligands or sorb to solid particles in water.

Ecotoxicity: Even though many metals show few toxic effects at physiological pH levels, transformation may introduce new or magnified effects.

Lead is primarily an atmospheric pollutant that enters soil and water as fallout, a process determined by physical form and particle size. Lead in the form of alkyls has been introduced to the environment primarily from leaded petrol. These are converted to water-soluble lead compounds of high toxicity and availability to plants. Such compounds easily leach from soil to contaminate water sources close to highways. Lead that has entered the aquatic system from run-off or as fallout of insoluble precipitates is found in sediments. The biological methylation of inorganic lead by lake sediment micro-organisms has been demonstrated although its significance is not entirely clear. Other forms of soluble or insoluble lead may also enter the environment and undergo bioaccumulation through a series of biological incidents.

DO NOT discharge into sewer or waterways.

Persistence and degradability

|            |                                       |                                       |
|------------|---------------------------------------|---------------------------------------|
| Ingredient | Persistence: Water/Soil               | Persistence: Air                      |
|            | No Data available for all ingredients | No Data available for all ingredients |

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### Bioaccumulative potential

| Ingredient | Bioaccumulation                       |
|------------|---------------------------------------|
|            | No Data available for all ingredients |

### Mobility in soil

| Ingredient | Mobility                              |
|------------|---------------------------------------|
|            | No Data available for all ingredients |

## SECTION 13 Disposal considerations

### Waste treatment methods

|                              |  |
|------------------------------|--|
| Product / Packaging disposal | <ul style="list-style-type: none"><li>Containers may still present a chemical hazard/ danger when empty.</li><li>Return to supplier for reuse/ recycling if possible.</li></ul> Otherwise: <ul style="list-style-type: none"><li>If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.</li><li>Where possible retain label warnings and SDS and observe all notices pertaining to the product.</li><li><b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li><li>It may be necessary to collect all wash water for treatment before disposal.</li><li>In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</li><li>Where in doubt contact the responsible authority.</li><li>Recycle wherever possible or consult manufacturer for recycling options.</li><li>Consult State Land Waste Management Authority for disposal.</li><li>Bury residue in an authorised landfill.</li><li>Recycle containers if possible, or dispose of in an authorised landfill.</li></ul> |
|------------------------------|--|

## SECTION 14 Transport information

### Labels Required

|                  |    |
|------------------|----|
| Marine Pollutant | NO |
|------------------|----|

Shipping container and transport vehicle placarding and labeling may vary from the below information. Products that are regulated for transport will be packaged and marked as Dangerous Goods in Excepted Quantities according to US DOT, IATA and IMDG regulations. In case of reshipment, it is the responsibility of the shipper to determine the appropriate labels and markings in accordance with applicable transport regulations.

**Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code**

| Product name | Group         |
|--------------|---------------|
| tin          | Not Available |
| lead         | Not Available |

**Transport in bulk in accordance with the IGC Code**

| Product name | Ship Type     |
|--------------|---------------|
| tin          | Not Available |
| lead         | Not Available |

## SECTION 15 Regulatory information

**Safety, health and environmental regulations / legislation specific for the substance or mixture**

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tin is found on the following regulatory lists

- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- US - Alaska Air Quality Control - Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5
- US - Massachusetts - Right To Know Listed Chemicals
- US DOE Temporary Emergency Exposure Limits (TEELs)

lead is found on the following regulatory lists

- Chemical Footprint Project - Chemicals of High Concern List
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- US - Alaska Air Quality Control - Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5
- US - California - Biomonitoring - Priority Chemicals
- US - California Proposition 65 - Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity
- US - California Proposition 65 - No Significant Risk Levels (NSRLs) for Carcinogens
- US - California Proposition 65 - Reproductive Toxicity
- US - California Safe Drinking Water and Toxic Enforcement Act of 1986 - Proposition 65 List
- US - Massachusetts - Right To Know Listed Chemicals
- US Clean Air Act - Hazardous Air Pollutants

- US NIOSH Recommended Exposure Limits (RELs)
- US OSHA Permissible Exposure Limits (PELs) Table Z-1
- US OSHA Permissible Exposure Limits (PELs) Table Z-3
- US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

- US CWA (Clean Water Act) - Priority Pollutants
- US CWA (Clean Water Act) - Toxic Pollutants
- US DOE Temporary Emergency Exposure Limits (TEELs)
- US EPA Integrated Risk Information System (IRIS)
- US EPCRA Section 313 Chemical List
- US National Toxicology Program (NTP) 15th Report Part B. Reasonably Anticipated to be a Human Carcinogen
- US NIOSH Recommended Exposure Limits (RELs)
- US OSHA Carcinogens Listing
- US OSHA Permissible Exposure Limits (PELs) Table Z-1
- US OSHA Permissible Exposure Limits (PELs) Table Z-3
- US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
- US TSCA Section 12(b) - List of Chemical Substances Subject to Export Notification Requirements

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 311/312 hazard categories


|  |     |
|--|-----|
| Flammable (Gases, Aerosols, Liquids, or Solids)              | No  |
| Gas under pressure   | No  |
| Explosive  | No  |
| Self-heating   | No  |
| Pyrophoric (Liquid or Solid)                                 | No  |
| Pyrophoric Gas   | No  |
| Corrosive to metal   | No  |
| Oxidizer (Liquid, Solid or Gas)                              | No  |
| Organic Peroxide   | No  |
| Self-reactive  | No  |
| In contact with water emits flammable gas                    | No  |
| Combustible Dust   | No  |
| Carcinogenicity  | No  |
| Acute toxicity (any route of exposure)                       | No  |
| Reproductive toxicity  | Yes |
| Skin Corrosion or Irritation                                 | No  |
| Respiratory or Skin Sensitization                            | No  |
| Serious eye damage or eye irritation                         | Yes |
| Specific target organ toxicity (single or repeated exposure) | No  |
| Aspiration Hazard  | No  |
| Germ cell mutagenicity                                       | No  |
| Simple Asphyxiant  | No  |
| Hazards Not Otherwise Classified                             | No  |

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

| Name | Reportable Quantity in Pounds (lb) | Reportable Quantity in kg |
|------|------------------------------------|---------------------------|
| lead | 10                                 | 4.54                      |

State Regulations

US. California Proposition 65

 **WARNING:** This product can expose you to chemicals including **lead**, which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

National Inventory Status

| National Inventory                              | Status  |
|---|---|
| Australia - AIIC / Australia Non-Industrial Use | Yes   |
| Canada - DSL                                    | Yes   |
| Canada - NDSL                                   | No (tin; lead)  |
| China - IECSC                                   | Yes   |
| Europe - EINEC / ELINCS / NLP                   | Yes   |
| Japan - ENCS                                    | No (tin; lead)  |
| Korea - KECI                                    | Yes   |
| New Zealand - NZIoC                             | Yes   |
| Philippines - PICCS                             | Yes   |
| USA - TSCA                                      | Yes   |
| Taiwan - TCSI                                   | Yes   |
| Mexico - INSQ                                   | Yes   |
| Vietnam - NCI                                   | Yes   |
| Russia - FBEPH                                  | Yes   |
| <b>Legend:</b>                                  | <i>Yes = All CAS declared ingredients are on the inventory<br/>No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.</i> |

SECTION 16 Other information

|               |            |
|---------------|------------|
| Revision Date | 24/01/29   |
| Initial Date  | 23/04/2023 |

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources using available literature references. The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

- PC—TWA: Permissible Concentration-Time Weighted Average
- PC—STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit.
- IDLH: Immediately Dangerous to Life or Health Concentrations
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL :No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index

AIIC: Australian Inventory of Industrial Chemicals  
DSL: Domestic Substances List  
NDSL: Non-Domestic Substances List  
IECSC: Inventory of Existing Chemical Substance in China  
EINECS: European INventory of Existing Commercial chemical Substances  
ELINCS: European List of Notified Chemical Substances  
NLP: No-Longer Polymers  
ENCS: Existing and New Chemical Substances Inventory  
KECI: Korea Existing Chemicals Inventory  
NZIoC: New Zealand Inventory of Chemicals  
PICCS: Philippine Inventory of Chemicals and Chemical Substances  
TSCA: Toxic Substances Control Act  
TCSI: Taiwan Chemical Substance Inventory  
INSQ: Inventario Nacional de Sustancias Químicas  
NCI: National Chemical Inventory  
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances