1. Identification of the substance/mixture and of the Company/undertaking:

1.1 Product identifier:

Product Name: Permite; Lojic +; GS-80, GS-80 Spherical; F400; Ultracaps +; Ultracaps S; SDI Admix; SDI Spherical and New Ultrafine Capsules.

1.2 Relevant identified use:

Relevant use:

Dental professional use: For filling of cavitated teeth by dental professionals.

1.3 Details of the supplier of the Safety Data Sheet:

Manufacturer / Supplier

SDI Limited
3-13 Brunsdon Street, Bayswater
Victoria, 3153, Australia

SDI (North America) Inc.
1279 Hamilton Parkway
Itasca, IL 60143, USA

Southern Dental Industries Ltd
Block 8, St Johns Court
Swords Road
Santry, Dublin 9, Ireland

SDI Brasil Indústria e Comércio Ltda
Rua Dr. Virgílio de Carvalho Pinto, 612
Pinheiros, São Paulo, 05415-020
Brasil

Telephone: +61 3 8727 7111 (Business hours)

Telephone: +1 630 361 9200 (Business hours)

Telephone: +353 1 886 9577 (Business Hours)

Telephone: +55 11 3092 7100 (Business Hours)

Emergency contact number: +61 3 8727 7111

Email: ray.cahill@sdi.com.au (Technical Director, SDI Limited)

2. Hazard Identification

Classification of the substance/mixture:

SIGNAL WORD: DANGER
2. Hazard Identification..continued

These products contain mercury. It is toxic if inhaled and acute exposure may cause allergic reactions including dermatitis, digestion and respiratory disorders.

California Prop 65 Warning

This product contains mercury, a chemical known to the State of California to cause birth defects or other reproductive harm.

GHS Classification:
Acute Tox. 2
Repr. 1B
STOT RE 1
Aquatic Acute 1
Aquatic Chronic 1

Materials are contained in two compartments. However, under normal conditions of use, contact with these materials by the user is generally not expected.

Hazard statement(s)
H330  Fatal if inhaled.
H360D  May damage the unborn child.
H372  Causes damage to organs through prolonged or repeated exposure.
H400  Very toxic to aquatic life.
H410  Very toxic to aquatic life with long lasting effects.

Precautionary statement(s):
Prevention:
P201  Obtain special instructions before use.
P202  Do not handle until all safety precautions have been read and understood.
P260  Do not breathe fumes/vapours.
P264  Wash hands thoroughly after handling.
P270  Do not eat, drink or smoke when using this product.
P271  Use only outdoors or in a well-ventilated area.
P284  Wear respiratory protection.
P280  Wear protective gloves/clothing.
P281  Use personal protective equipment as required.

Response:
P304+P340:  IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P310  Immediately call a POISON CENTRE or doctor/physician.
P320  Specific treatment is urgent- refer to first aid instructions Section 4.
P308+P313  IF exposed or concerned: Get medical advice/attention.
P301+P310  IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.
P321  Specific treatment, refer to First Aid instructions Section 4.
P330  Rinse mouth.
P363  Wash contaminated clothing before re-use.

Storage:
P405  Store locked up.

Disposal
P501  Dispose of contents/container to an approved waste disposal plant.
3. Composition / Information on ingredients

**Capsules**

<table>
<thead>
<tr>
<th>Hazardous ingredients</th>
<th>Wt.%</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>Index No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury, metallic (40-50% of total product)</td>
<td>100</td>
<td>7439-97-6</td>
<td>231-106-7</td>
<td>080-001-00</td>
</tr>
</tbody>
</table>

Hazard class: Acute Tox. 2, Repr 1B, STOT RE 1, Aquatic Acute 1, Aquatic Chronic 1.

4. First Aid Measures

**General advice:** Contains metallic mercury. In case of accident or if you feel unwell, seek medical advice immediately (show label and instructions for use where possible).

**If inhaled:** Very toxic by inhalation. Remove to fresh air. Seek medical attention. If not breathing give artificial respiration. May cause respiratory disorders including inflammation and fluid retention. Inhalation of mercury vapours at high concentration can cause dyspnea, coughing, fever, severe nausea, vomiting, excess salivation, kidney damage with renal shutdown.

**If ingested:** Call a physician immediately. Rinse mouth and give large amounts of water.

**On skin contact:** Wash skin with soap and water. Remove contaminated clothing. May cause irritation and allergic reaction. If irritation develops, if feeling unwell, or if concerned, get medical advice/attention.

**On contact with eyes:** Do not let victim rub eyes or keep them closed. Extensive irrigation with tepid water is required (at least 15 minutes). Obtain medical advice if irritation persists. May cause irritation and allergic reaction. If irritation develops, if feeling unwell, or if concerned, get medical advice/attention.

**Most important effects, acute and delayed:**
The most important known symptoms and effects are described in section 2 and/or in section 11.

**Indication of any immediate medical attention and special treatment needed:** No data available.

5. Fire Fighting Measures

**Suitable extinguishing media:** As for adjacent fire. Water spray, Foam, Carbon Dioxide, dry Chemical and other “ABC” Class may be used.

**Special protective equipment:** In fires involving large quantities of product, use self-contained breathing apparatus and full protective equipment.

**Unusual Fire and Explosion Hazards:** Mercury is not flammable and is relatively stable although it can react with many metals to form amalgams.
5. Fire Fighting Measures


Explosion Sensitivity to Static Discharge: Not sensitive.

Unsuitable extinguishing media: None specified.

Specific hazards arising from the mixture:
Mercury vapours generated during fires involving these products are toxic; additionally, this element can be irritating to contaminated tissue. Therefore, this product presents a severe health hazard to firefighters.

Advice for firefighters:
Wear self contained breathing apparatus and full protective equipment.
Move fire exposed containers, if it can be done without risk to firefighters.
Apply cooling water to sides of containers that are exposed to flame until well after fire is out.
Decontaminate all equipment thoroughly after the conclusion of fire-fighting activities. If possible, prevent run-off water from entering storm drains, bodies of water, or other environmentally sensitive areas.

Further information:
Hazardous decomposition products may be produced. (Refer to Section 10).

6. Accidental Release Measures

Spillages:
Mercury presents a health hazard if incorrectly handled, and is dangerous for the environment. Spillages of mercury should be removed immediately, including from places which are difficult to access.
Wearing protective clothing, use a plastic syringe to draw it up.
Smaller quantities can be covered by sulphur powder and removed.
Avoid inhalation of the vapour.

Personal precautions:
Wear appropriate MSHA approved respirator, gloves, safety goggles and protective clothing to prevent skin contact and inhalation.

Environmental precautions:
Prevent any spillage from entering drains or waterways.

Methods for cleaning and containment of spills:
Avoid contact with skin and eyes, and avoid inhalation. Pick up with dust pan or method that does not break up mercury into smaller droplets, etc. Store in a sealed plastic container, away from heat and flame, until disposal via an approved Recycler and according to local regulations. Ensure adequate ventilation.
7. Handling and storage

Handling: Do not breathe powder and avoid exposed mercury surfaces. Wear appropriate gloves, goggles/face protection and protective clothing to prevent skin contact. Wash thoroughly after handling. Keep away from food, drink and around animal feed stuffs.

Storage: Store only in unopened original containers. Keep container tightly closed and dry. Storage in large quantities (as in warehouse) should be in a ventilated, cool area. Do not store in metal containers. Keep away from sources of ignition and elevated temperatures, recommended <25°C.

Distribution: During distribution, to our customers, this product can be transported in non-refrigerated conditions between 15°C to 25°C. This product can also withstand temperatures up to 40°C for short periods (2 to 3 days) and intermittent peaks up to 50°C.

Specific end use: Apart from the use mentioned in section 1.2, there are no other uses for the product.

8. Exposure controls and personal protection

Control parameters:  
Occupational exposure limits:

8-Hour TWAs: Mercury - 0.025 mg/m³ (Skin) (ACGIH); 0.05 mg/m³ (Skin) (OSHA/UK & NOHSC/Australia); 0.1 mg/m³ (Short term) (Germany);
Silver - 0.01 mg/m³ (OSHA/Germany); 0.1 mg/m³ (ACGIH/U.K. & NOHSC/Australia)
Tin - 2 mg/m³ (OSHA/ACGIH/Germany & NOHSC/Australia); 5 mg/m³ (U.K.);
Copper - 1 mg/m³ (OSHA/ACGIH/Germany/UK & NOHSC/Australia)
Indium - 0.1 mg/m³ (OSHA/UK & NOHSC/Australia)
Zinc - 1 mg/m³ (ACGIH)

These levels are not anticipated under foreseeable use conditions.

Personal protective equipment

Respiratory equipment: None required under normal use conditions.
Hand protection: Impervious gloves.
Eye protection: Safety goggles.

General safety and hygiene measures: Use only as directed. Wash hands after use.
9. **Physical and chemical properties**

**Form and Colour:**
Silver alloy powder and mercury in separate compartments of a plastic capsule.
Silver alloy – grey fine metallic powder.
Mercury – Silver-white heavy liquid metal.

**Odour:**
Odourless

**Melting point / melting range:**
(Mercury): -38.9°C

**Boiling point / boiling range:**
(Mercury): 356.6°C

**Flammable:**
Not applicable

**Flash point:**
Not applicable

**Explosion limits:**
Not applicable

**Ignition temperature:**
Not applicable

**Vapour pressure:**
(Mercury) 0.0012 mmHg at 20°C

**Specific Gravity:**
(Mercury) 13.6 g/cm³

**% Volatiles:**
Not applicable

**Solubility in water:**
Insoluble

**Solubility in other solvents:**
Insoluble in alcohol

**pH value:**
Not applicable

**Partition co-efficient (n-octanol/water):**
Not determined

**Viscosity:**
Not determined

**Evaporation rate:**
Not determined

**Relative vapour density (air = 1):**
(Mercury): - 6.9

**Auto-ignition temperature:**
Not available

**Decomposition temperature:**
Not available

**Explosive Properties:**
No data available

10. **Stability and Reactivity**

**Reactivity:**
No data available.

**Chemical Stability:**
Stable under recommended storage conditions.

**Thermal decomposition:**
No decomposition under normal conditions

**Substance(s) to avoid:**
Strong oxidizers

**Hazardous reactions:**
Mixtures of mercury with acetylene, ammonia, chlorine dioxide, methyl azide, chlorates, nitrates, or hot sulfuric acid can be explosive. Readily amalgamates with most metals.

**Hazardous decomposition products:**
Slightly volatile at room temperature, atmospheric pressure. When exposed to high temperatures, mercury vaporizes to extremely toxic fumes.
11. Toxicological information

Critical hazards to man:
Very toxic by inhalation. Toxic - danger of serious damage to health by prolonged exposure through inhalation. Acute exposure may cause allergic reactions including dermatitis, digestion and respiratory disorders. May cause harm to the unborn child.

Critical hazards to the environment: Dangerous for the environment.

Serious eye damage/irritation: Irritating to eyes.

Skin corrosion/irritation: May cause allergic skin reactions. May be irritant or corrosive.

Respiratory or skin sensitisation: Very toxic by inhalation.

Ingestion: Very hazardous by ingestion. May cause damage to blood, kidneys, liver, brain, peripheral nervous system, central nervous system.

Germ cell mutagenicity: No data available.

Carcinogenicity: Classified A5 (not suspected for human) by ACGIH. 3 (not classifiable for human) by IARC.

None available regarding product. Some information supplied for ingredient(s).

LCLo / Inhalation / Rabbit: (Mercury) 29 mg/m^3/30 Hour

Chronic Health Effects: Inhalation of mercury vapours, dusts or organic vapours, or skin absorption or mercury over long periods can cause mercurialism. Symptoms include tremors, inflammation of mouth and gums, excessive salivation, stomatitis, blue lines on gums, pain and numbness in extremities, weight loss, mental depression, and nervousness. Exposure may aggravate kidney disorders, chronic respiratory disease and nervous system disorders. May cause damage to blood, kidneys, liver, brain, peripheral nervous system, central nervous system.

Alloy powder and mercury are in pre-dosed capsules, so the danger of exposure to mercury vapours is low.

12. Ecological information

German "Wassergefaehrdungs Klasse (WGK):3
This product must not enter effluent, ground water, surface water or the soil.

Self-Assessment: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Ecotoxicity: No data available.

Persistence and biodegradability: No data available.

Bioaccumulative potential: No data available.
12. Ecological information

Mobility in soil: No data available.
Other adverse effects: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

13. Disposal considerations

Product: Dispose in accordance with local regulations.

The 1991 Environmental Protection (Duty of Care) Regulations SI No. 2839 and amendments should be noted (United Kingdom).

Contaminated packaging: Dispose of contaminated packaging as hazardous waste in accordance with local official regulations.

14. Transport information

IATA:
Product: Amalgam Capsule
Contains: Mercury
Proper Shipping Name: Mercury contained in manufactured articles
UN Number: UN 3506
Packing Group: III
Class (sub risk): 8 (6.1) Corrosive & Toxic
IATA Limits: EQ - E0 (not permitted as excepted quantity)
LQ - Forbidden for passenger and cargo aircraft
CAO - no limit
PAX - no limit

Not classified as Dangerous Goods for sea, road and rail transport.

15. Regulatory information

These products are regulated by: TGA
Medical Devices Directives 93/42/EEC
FDA
National regulations

16. Other information

Prepared by: SDI Limited
3-13 Brunsdon Street, Bayswater Victoria, 3153, Australia
Phone Number: +61 3 8727 7111
16. Other information

The information contained in the Safety Data Sheet is based on data considered to be accurate, however, no warranty is expressed or implied regarding the accuracy of the data or the results to be obtained from the use thereof.

Date of preparation/revision: 25 June 2015.
Department issuing SDS: Research and Development
Contact: R&D Director
SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

<table>
<thead>
<tr>
<th>Product Identifier</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product name</strong></td>
<td>Permite; Lojic +; GS-80, GS-80 Spherical; F400; Ultracaps +; Ultracaps S; SDI Admix; SDI Spherical and New Ultrafine- Capsules</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Proper shipping name</strong></td>
<td>MERCURY CONTAINED IN MANUFACTURED ARTICLES</td>
</tr>
<tr>
<td><strong>Other means of identification</strong></td>
<td>Not Available</td>
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</tbody>
</table>

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

- Relevant identified uses: For filling of cavitated teeth by dental professionals.

Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>SDI Limited</th>
<th>SDI Brazil Industria E Comercio Ltda</th>
<th>SDI Germany GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Address</strong></td>
<td>3-15 Brunsdon Street VIC Bayswater 3153 Australia</td>
<td>Rua Dr. Virgilio de Carvalho Pinto, 612 São Paulo CEP 05415-020 Brazil</td>
<td>Hansestrasse 85 Cologne D-51149 Germany</td>
</tr>
<tr>
<td><strong>Telephone</strong></td>
<td>+61 3 8727 7111 (Business Hours)</td>
<td>+55 11 3092 7100</td>
<td>+49 0 2203 9255 0</td>
</tr>
<tr>
<td><strong>Fax</strong></td>
<td>+61 3 8727 7222</td>
<td>+55 11 3092 7101</td>
<td>+49 0 2203 9255 200</td>
</tr>
<tr>
<td><strong>Email</strong></td>
<td><a href="mailto:info@sdi.com.au">info@sdi.com.au</a></td>
<td><a href="mailto:brasil@sdi.com.au">brasil@sdi.com.au</a></td>
<td><a href="mailto:germany@sdi.com.au">germany@sdi.com.au</a></td>
</tr>
</tbody>
</table>

Emergency telephone number

<table>
<thead>
<tr>
<th>Association / Organisation</th>
<th>SDI Limited</th>
<th>Not Available</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emergency telephone numbers</strong></td>
<td>+61 3 8727 7111</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

- **HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.**

<table>
<thead>
<tr>
<th>Poisons Schedule</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classification [1]</strong></td>
<td>Metal Corrosion Category 1, Acute Toxicity (Oral) Category 4, Acute Toxicity (Inhalation) Category 2, Eye Iritation Category 2A, Reproductive Toxicity Category 1B, Specific target organ toxicity - repeated exposure Category 1, Chronic Aquatic Hazard Category 1</td>
</tr>
</tbody>
</table>

Legend:


Label elements

Continued...
SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances
See section below for composition of Mixtures

Mixtures

<table>
<thead>
<tr>
<th>CAS No</th>
<th>%[weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>capsules</td>
</tr>
<tr>
<td>7439-97-6</td>
<td>40-50</td>
<td>mercury (elemental)</td>
</tr>
</tbody>
</table>

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact
- If this product comes in contact with the eyes:
  - Immediately hold eyelids apart and flush the eye continuously with running water.
  - 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.
  - Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
  - Transport to hospital or doctor without delay.
**SECTION 5 FIREFIGHTING MEASURES**

**Extinguishing media**
- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

**Indication of any immediate medical attention and special treatment needed**
- Moderate adsorption of inorganic mercury compounds through the gastro-intestinal tract (7-15%) is the principal cause of poisoning. These compounds are highly concentrated (as the mercuric [Hg (2+) form) in the kidney; acute ingestion may lead to oliguric renal failure. Severe mucosal necrosis may also result from ingestion.
- Chronic effects range from proteinuria to nephrotic syndrome. Chronic presentation also involves dermatitis, gingivitis, stomatitis, tremor and neuropsychiatric symptoms of erethism.
- Absorbed inorganic mercury does not significantly cross the blood-brain barrier.
- Emesis and lavage should be initiated following acute ingestion.
- Activated charcoal interrupts absorption; cathartics should be administered when charcoal is given.
- The use of British Anti-Lewisite is indicated in severe inorganic poisoning. Newer derivatives of BAL (e.g. dimercaptosuccinic acid, [DMSA] and 2,3-dimercapto-1-propanesulfate [DMPS]) may prove more effective. [Ellenhorn and Barceloux: Medical Toxicology]

**BIOLOGICAL EXPOSURE INDEX - BEI**

These represent the determinants observed in specimens from a healthy worker exposed at the Exposure Standard (ES or TLV).

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Index</th>
<th>Sampling Time</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total inorganic mercury in urine</td>
<td>35 ug/gm creatinine</td>
<td>Preshift</td>
<td>B</td>
</tr>
<tr>
<td>2. Total inorganic mercury in blood</td>
<td>15 ug/L</td>
<td>End of shift at end of workweek</td>
<td>B</td>
</tr>
</tbody>
</table>

B: Background levels occur in specimens collected from subjects NOT exposed.

for corrosives:
- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for pulmonary oedema.
- Monitor and treat, where necessary, for shock.
- Anticipate seizures.
- Where eyes have been exposed, flush immediately with water and continue to irrigate with normal saline during transport to hospital.
- DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- Skin burns should be covered with dry, sterile bandages, following decontamination.
- DO NOT attempt neutralisation as exothermic reaction may occur.

**ADVANCED TREATMENT**

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive-pressure ventilation using a bag-valve mask might be of use.
- Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Treat seizures with diazepam.
- Propanoic acid hydrochloride should be used to assist eye irrigation.

**EMERGENCY DEPARTMENT**

- Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorous and magnesium, may assist in establishing a treatment regime.
- Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- Consider endoscopy to evaluate oral injury.
- Consult a toxicologist as necessary.

BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed 1994
Special hazards arising from the substrate or mixture

Fire Incompatibility
- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters

Fire Fighting
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.
- Slight hazard when exposed to heat, flame and oxidisers.

Fire/Explosion Hazard
Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.
Articles and manufactured articles may constitute a fire hazard where polymers form their outer layers or where combustible packaging remains in place.
Certain substances, found throughout their construction, may degrade or become volatile when heated to high temperatures. This may create a secondary hazard.
May emit corrosive fumes. May emit poisonous fumes.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Minor Spills
- Use suction bottle to collect small amounts of mercury.
- Calcium polysulfide with excess sulfur can be sprinkled into cracks or other inaccessible places to convert mercury globules into the sulfide.
- Collect solid residues and place in tightly sealed, clean, dry containers
- Clean up all spills immediately.
- Secure tank if safe to do so.
- Bundle/collection recoverable product.
- Collect remaining material in containers with covers for disposal.

Major Spills
- Avoid all personal contact and wear full protective equipment
- Environmental hazard: contain spillage. Stop leak if safe to do so.
- Clean up bulk mercury spillage by mechanical means, suck up where practicable.
- Calcium polysulfide with excess sulfur can be sprinkled into cracks or other inaccessible places to convert mercury globules into the sulfide. (Proprietary products are available for this purpose)
- Collect solid residues and place in clean, dry, sealable plastic drums.
- Ensure that all residues are cleaned up.
- Do NOT wash spill area after clean up.
- Vacuum up residues.

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

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Avoid contact with moisture.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer’s storage and handling recommendations contained within this SDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Other information
- Store below 25 deg. C.
- Store in a dry and well ventilated area, away from heat and sunlight.

Conditions for safe storage, including any incompatibilities

Suitable container
- DO NOT repack. Use containers supplied by manufacturer only.

Storage incompatibility
- Avoid reaction with oxidising agents

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

<table>
<thead>
<tr>
<th>Source</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA</th>
<th>STEL</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia Exposure Standards</td>
<td>mercury (elemental)</td>
<td>Mercury; elemental vapour (as Hg)</td>
<td>0.025 mg/m3</td>
<td>0.003 ppm</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

EMERGENCY LIMITS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>mercury (elemental)</td>
<td>Mercury vapor</td>
<td>0.15 mg/m3</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>
Exposure controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:
- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
- Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection.

Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.

An approved self contained breathing apparatus (SCBA) may be required in some situations. Employers may need to use multiple types of controls to prevent employee overexposure. Provide adequate ventilation in warehouse or closed storage area. 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.

### Appropriate engineering controls

<table>
<thead>
<tr>
<th>Type of Contaminant:</th>
<th>Air Speed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>solvent, vapours, degreasing etc., evaporating from tank (in still air).</td>
<td>0.25-0.5 m/s (50-100 f/min.)</td>
</tr>
<tr>
<td>aerosols, fumes from pouring operations, intermittent container filling, low-speed conveyor transfers, welding, spray drift, plating</td>
<td>0.5-1 m/s (100-200 f/min.)</td>
</tr>
<tr>
<td>acid fumes, picking (released at low velocity into zone of active generation)</td>
<td>1-2.5 m/s (200-500 f/min.)</td>
</tr>
<tr>
<td>direct spray, spray painting in shallow booths, drum filling, conveyor loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)</td>
<td>2.5-10 m/s (500-2000 f/min.)</td>
</tr>
</tbody>
</table>

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
2: Contaminants of low toxicity or of nuisance value only.
3: Intermittent, low production.
4: Large hood or large air mass in motion

### Personal 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

Wear impervious gloves.

### Body protection

See Other protection below

### Other protection

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

### Thermal hazards

Not Available

### Respiratory protection

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

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Original IDLH</th>
<th>Revised IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>mercury (elemental)</td>
<td>10 mg/m³ / 28 mg/m³</td>
<td>2 mg/m³ / 10 mg/m³</td>
</tr>
</tbody>
</table>

**MATERIAL DATA**

**Ingredient**

- mercury (elemental)

**Exposure controls**

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.
SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Silver alloy powder and mercury in separate compartments of a plastic capsule. Grey fine metallic powder (Silver alloy) and silver-white heavy liquid metal (Mercury) with no odour, insoluble in water.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Manufactured</td>
</tr>
<tr>
<td>Odour</td>
<td>Not Available</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not Available</td>
</tr>
<tr>
<td>pH (as supplied)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Melting point / freezing point (°C)</td>
<td>356.6 (Mercury)</td>
</tr>
<tr>
<td>Initial boiling point and boiling range (°C)</td>
<td>-38.9 (Mercury)</td>
</tr>
<tr>
<td>Flash point (°C)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Vapour pressure (kPa)</td>
<td>0 @ 20 deg C (Mercury)</td>
</tr>
<tr>
<td>Solubility in water (g/L)</td>
<td>Immiscible</td>
</tr>
<tr>
<td>Vapour density (Air = 1)</td>
<td>-6.9 (Mercury)</td>
</tr>
</tbody>
</table>

SECTION 10 STABILITY AND REACTIVITY

Reactivity

See section 7

Chemical stability

- Unstable in the presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Possibility of hazardous reactions

See section 7

Conditions to avoid

See section 7

Incompatible materials

See section 7

Hazardous decomposition products

See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled

Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure. The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation. Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce severely toxic effects. Relatively small amounts absorbed from the lungs may prove fatal. Limited evidence or practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, involving the recruitment and activation of many cell types, mainly derived from the vascular system.

Ingestion

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. Following ingestion of mercury compounds, symptoms may appear within the first few minutes and may include pain, profuse vomiting and severe purging; the victim may die within a few hours from peripheral vascular collapse secondary to fluid and electrolyte loss. Primary gastroenteritis may subside spontaneously within a few days but severe haemorrhagic inflammation of the colon (colitis) has occurred as late as 9 days following ingestion. A second phase developing over 1-3 days is characterised by stomatitis (lesions of the mouth parts), membranous colitis and kidney damage (tubular nephritis). This second phase is associated with a slow and prolonged excretion of mercury by salivary glands, the gastrointestinal mucosa and kidneys. Death in this phase usually occurs as a result of kidney failure.

The alimentary effects of many mercury compounds are so rapid that the course and outlook is largely determined by events within the first 5-10 minutes. Acute
### SECTION 12 ECOLOGICAL INFORMATION

#### Toxicity

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Endpoint</th>
<th>Test Duration (hr)</th>
<th>Species</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>mercury (elemental)</td>
<td>BCF</td>
<td>720</td>
<td>Fish</td>
<td>0.001mg/L</td>
<td>4</td>
</tr>
<tr>
<td>mercury (elemental)</td>
<td>EC50</td>
<td>72</td>
<td>Algae or other aquatic plants</td>
<td>0.002mg/L</td>
<td>4</td>
</tr>
<tr>
<td>mercury (elemental)</td>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>0.004mg/L</td>
<td>4</td>
</tr>
<tr>
<td>mercury (elemental)</td>
<td>EC50</td>
<td>240</td>
<td>Fish</td>
<td>0.0003mg/L</td>
<td>5</td>
</tr>
<tr>
<td>mercury (elemental)</td>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>0.0003mg/L</td>
<td>2</td>
</tr>
<tr>
<td>mercury (elemental)</td>
<td>NOEC</td>
<td>2088</td>
<td>Crustacea</td>
<td>0.00025mg/L</td>
<td>2</td>
</tr>
</tbody>
</table>
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. **DO NOT** discharge into sewer or waterways.

### Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Data available for all ingredients</td>
<td>No Data available for all ingredients</td>
</tr>
</tbody>
</table>

### Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Data available for all ingredients</td>
</tr>
</tbody>
</table>

### Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Data available for all ingredients</td>
</tr>
</tbody>
</table>

### SECTION 13 DISPOSAL CONSIDERATIONS

#### Waste treatment methods

Consult State Land Waste Management Authority for disposal.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurrying in water; Neutralisation followed by; burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

### SECTION 14 TRANSPORT INFORMATION

#### Labels Required

- **Marine Pollutant** - HAZCHEM 2X

#### Land transport (ADG)

| UN number | 3506 |
| Packing group | III |
| UN proper shipping name | MERCURY CONTAINED IN MANUFACTURED ARTICLES |
| Environmental hazard | Not Applicable |
| Transport hazard class(es) | Class 8, Subrisk 6.1 |
| Special precautions for user | Limited quantity 5 kg |

#### Air transport (ICAO-IATA / DGR)

| UN number | 3506 |
| Packing group | III |
| UN proper shipping name | Mercury contained in manufactured articles |
| Environmental hazard | Not Applicable |
| Transport hazard class(es) | ICAO/IATA Class 8, ICAO / IATA Subrisk 6.1 |

**Continue...**
Special precautions for user

Special provisions: A48 A69 A191
Cargo Only Packing Instructions: 869
Cargo Only Maximum Qty / Pack: No Limit
Passenger and Cargo Packing Instructions: 869
Passenger and Cargo Maximum Qty / Pack: No Limit
Passenger and Cargo Limited Quantity Packing Instructions: Forbidden
Passenger and Cargo Limited Maximum Qty / Pack: Forbidden

Sea transport (IMDG-Code / GGVSee)

UN number: 3506
Packing group: III
UN proper shipping name: MERCURY CONTAINED IN MANUFACTURED ARTICLES
Environmental hazard: Marine Pollutant
Transport hazard class(es): IMDG Class: 8, IMDG Subrisk: 6.1

Special precautions for user
EMS Number: F-A, S-B
Special provisions: 366
Limited Quantities: 5 kg

Transport in bulk according to Annex II of MARPOL and the IBC code
Not Applicable

SECTION 15 REGULATORY INFORMATION

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

MERCURY (ELEMENTAL)(7439-97-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS
Australia Exposure Standards
Australia Hazardous Substances Information System - Consolidated Lists
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

<table>
<thead>
<tr>
<th>National Inventory</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia - AICS</td>
<td>Y</td>
</tr>
<tr>
<td>Canada - DSL</td>
<td>Y</td>
</tr>
<tr>
<td>Canada - NDSL</td>
<td>N (mercury (elemental))</td>
</tr>
<tr>
<td>China - IECSC</td>
<td>Y</td>
</tr>
<tr>
<td>Europe - EINEC / ELINCS / NLP</td>
<td>Y</td>
</tr>
<tr>
<td>Japan - ENCS</td>
<td>N (mercury (elemental))</td>
</tr>
<tr>
<td>Korea - KECI</td>
<td>Y</td>
</tr>
<tr>
<td>New Zealand - NZIoC</td>
<td>Y</td>
</tr>
<tr>
<td>Philippines - PICCS</td>
<td>Y</td>
</tr>
<tr>
<td>USA - TSCA</td>
<td>Y</td>
</tr>
</tbody>
</table>

Legend:
Y = All ingredients are on the inventory
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Other information
Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by SDI Limited 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
OSF: Odour Safety Factor
NOAEL: No Observed Adverse Effect Level

Continued...
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

The information contained in the Safety Data Sheet is based on data considered to be accurate, however, no warranty is expressed or implied regarding the accuracy of the data or the results to be obtained from the use thereof.

Other information:

Prepared by: SDI Limited
3-15 Brunsdon Street, Bayswater Victoria, 3153, Australia

Phone Number: +61 3 8727 7111

Date of preparation/revision: 23rd September 2015

Department issuing SDS: Research and Development

Contact: Technical Director