SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1. Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>Riva Star</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>Not Available</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>AMMONIA SOLUTION, relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia</td>
</tr>
<tr>
<td>Other means of</td>
<td>Not Available</td>
</tr>
<tr>
<td>identification</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Relevant identified uses</th>
<th>(Riva Star is comprised of Riva Star Step 1 and Riva Star Step 2) for use as a tooth desensitising agent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses advised against</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

1.3. 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>Address</td>
<td>3-15 Brunswick 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>Telephone</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>Fax</td>
<td>+61 3 8727 7222</td>
<td>+55 11 3092 7101</td>
<td>+49 0 2203 9255 200</td>
</tr>
<tr>
<td>Email</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>

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>SDI (North America) Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>1279 Hamilton Parkway IL Itasca 60143 United States</td>
</tr>
<tr>
<td>Telephone</td>
<td>+1 630 361 9200 (Business hours)</td>
</tr>
<tr>
<td>Fax</td>
<td>Not Available</td>
</tr>
<tr>
<td>Website</td>
<td>Not Available</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:USA.Canada@sdi.com.au">USA.Canada@sdi.com.au</a></td>
</tr>
</tbody>
</table>

1.4. 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>Emergency telephone numbers</td>
<td>+61 3 8727 7111</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Other emergency telephone numbers</td>
<td><a href="mailto:ray.ohill@sdi.com.au">ray.ohill@sdi.com.au</a></td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

SECTION 2 HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture


| DSD classification | In case of mixtures, classification has been prepared by following DPD (Directive 1999/45/EC) and CLP Regulation (EC) No 1272/2008 regulations |
DPD classification

R34 Causes burns.
R50 Very toxic to aquatic organisms.


Classification according to regulation (EC) No 1272/2008 [CLP] [1]

Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1B, Acute Aquatic Hazard Category 1


2.2. Label elements

CLP label elements

SIGNAL WORD DANGER

Hazard statement(s)

H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.
H400 Very toxic to aquatic life.

Supplementary statement(s)

Not Applicable

Precautionary statement(s) Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Keep only in original container.
P273 Avoid release to the environment.

Precautionary statement(s) Response

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER/doctor/physician/first aider.
P363 Wash contaminated clothing before reuse.
P390 Absorb spillage to prevent material damage.
P391 Collect spillage.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Precautionary statement(s) Storage

P405 Store locked up.

Precautionary statement(s) Disposal

P501 Dispose of contents/container in accordance with local regulations.

2.3. Other hazards

Ingestion may produce health damage*.
Cumulative effects may result following exposure*.

REACH - Art.57-59: The mixture does not contain Substances of Very High Concern (SVHC) at the SDS print date.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Substances

See ‘Composition on ingredients’ in Section 3.2

3.2. Mixtures

<table>
<thead>
<tr>
<th>1.CAS No</th>
<th>2.EC No</th>
<th>3.Index No</th>
<th>4.REACH No</th>
<th>% [weight]</th>
<th>Name</th>
<th>Classification according to directive 67/548/EEC [DSD]</th>
<th>Classification according to regulation (EC) No 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>each 0.05ml capsule of Riva Star Step 1 contains:</td>
<td></td>
</tr>
</tbody>
</table>
SECTION 4 FIRST AID MEASURES

4.1. Description of first aid measures

**General**
- If skin contact occurs:
  - Immediately remove all contaminated clothing, including footwear.
  - Flush skin and hair with running water (and soap if available).
  - Seek medical attention in event of irritation.

- 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 Poison Information Centre or a doctor, or for at least 15 minutes.
  - Transport to hospital or doctor without delay.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
  - Seek medical attention.
  - If swallowed do NOT induce vomiting.
  - If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
  - Observe the patient carefully.
  - Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
  - Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
  - Seek medical advice.

**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.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

**Skin Contact**
- If skin contact occurs:
  - Immediately remove all contaminated clothing, including footwear.
  - Flush skin and hair with running water (and soap if available).
  - Seek medical attention in event of irritation.

**Inhalation**
- If fumes or combustion products are inhaled remove from contaminated area.
  - Seek medical attention.

**Ingestion**
- If swallowed do NOT induce vomiting.
  - If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
  - Observe the patient carefully.
  - Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
  - Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
  - Seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 FIREFIGHTING MEASURES

5.1. Extinguishing media
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

5.2. Special hazards arising from the substrate or mixture

Continued...
5.3. 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.

**Fire/Explosion Hazard**
- Non combustible.
- Not considered to be a significant fire risk.
- Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- May emit corrosive, poisonous fumes. May emit acrid smoke.
- Decomposition may produce toxic fumes of; nitrogen oxides (NOx), ammonia

### SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
See section 8

6.2. Environmental precautions
See section 12

6.3. Methods and material for containment and cleaning up

**Minor Spills**
- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact with the substance, by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable, labelled container for waste disposal.

**Major Spills**
- Clear area of personnel and move upwind.
- 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.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue (see Section 13 for specific agent).
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

6.4. Reference to other sections
Personal Protective Equipment advice is contained in Section 8 of the SDS.

### SECTION 7 HANDLING AND STORAGE

7.1. 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.

**Fire and explosion protection**
See section 5

**Other information**
- **Do not** store in direct sunlight.
- Store in a dry and well ventilated area, away from heat and sunlight.

7.2. Conditions for safe storage, including any incompatibilities

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

**Storage incompatibility**
- Avoid contact with copper, aluminium and their alloys.

7.3. Specific end use(s)
SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

<table>
<thead>
<tr>
<th>DERIVED NO EFFECT LEVEL (DNEL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PREDICTED NO EFFECT LEVEL (PNEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OCCUPATIONAL EXPOSURE LIMITS (OEL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INGREDIENT DATA</td>
</tr>
</tbody>
</table>

<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>UK Workplace Exposure Limits (WELs)</td>
<td>silver(I) fluoride</td>
<td>Silver (soluble compounds as Ag)</td>
<td>0.01 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>UK Workplace Exposure Limits (WELs)</td>
<td>silver(I) fluoride</td>
<td>Fluoride (inorganic as F)</td>
<td>2.5 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs)</td>
<td>silver(I) fluoride</td>
<td>Silver (soluble compounds as Ag)</td>
<td>0.01 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>European Union (EU) Commission Directive 2006/15/EC establishing a second list of indicative occupational exposure limit values (IOELVs)</td>
<td>silver(I) fluoride</td>
<td>Silver (soluble compounds as Ag)</td>
<td>0.01 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs)</td>
<td>silver(I) fluoride</td>
<td>Inorganic Fluorides</td>
<td>2.5 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Skin</td>
</tr>
<tr>
<td>UK Workplace Exposure Limits (WELs)</td>
<td>ammonia</td>
<td>Ammonia, anhydrous</td>
<td>18 mg/m³ / 25 ppm</td>
<td>25 mg/m³ / 35 ppm</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (English)</td>
<td>ammonia</td>
<td>Ammonia, anhydrous</td>
<td>14 mg/m³ / 20 ppm</td>
<td>36 mg/m³ / 50 ppm</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs)</td>
<td>ammonia</td>
<td>Ammonia</td>
<td>14 mg/m³ / 20 ppm</td>
<td>36 mg/m³ / 50 ppm</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EMERGENCY LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredient</td>
</tr>
<tr>
<td>ammonia</td>
</tr>
<tr>
<td>ammonia</td>
</tr>
<tr>
<td>silver(I) fluoride</td>
</tr>
<tr>
<td>ammonia</td>
</tr>
<tr>
<td>water</td>
</tr>
<tr>
<td>Ingredients determined not to be hazardous</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MATERIAL DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2. Exposure controls</td>
</tr>
</tbody>
</table>

**8.2.1. Appropriate engineering 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.

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in special circumstances. If risk of overexposure exists, wear approved respirator. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. Provide adequate ventilation in warehouses and enclosed storage areas. 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:
solvent, vapours, degreasing etc., evaporating from tank (in still air).
0.25-0.5 m/s (50-100 f/min)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)
0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)
1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion)
2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

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

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 m/s (200-400 f/min) for extraction of solvents generated in a tank 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.

### 8.2.2. Personal protection

#### 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
- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber
- Rubber Gloves

#### Body protection
See Other protection below

#### Other protection
No special equipment needed when handling small quantities.

**OTHERWISE:**
- Overalls.
- Barrier cream.
- Eyewash unit.

#### Thermal hazards
Not Available

### Respiratory protection

Type AK 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>Required Minimum Protection Factor</th>
<th>Half-Face Respirator</th>
<th>Full-Face Respirator</th>
<th>Powered Air Respirator</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 5 x ES</td>
<td>AK-AUS / Class 1</td>
<td>-</td>
<td>AK-PAPR-AUS / Class 1</td>
</tr>
<tr>
<td>up to 25 x ES</td>
<td>Air-line*</td>
<td>AK-2</td>
<td>AK-PAPR-2</td>
</tr>
<tr>
<td>up to 50 x ES</td>
<td>-</td>
<td>AK-3</td>
<td>-</td>
</tr>
<tr>
<td>50+ x ES</td>
<td>-</td>
<td>Air-line**</td>
<td>-</td>
</tr>
</tbody>
</table>

^ - Full-face

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(SO2), G = Agricultural chemicals, K = Ammonia(NH3), H = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

### 8.2.3. Environmental exposure controls
See section 12

### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

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

| Appearance | Clear, colourless liquid with ammonia odour. |
| Physical state | Liquid |
| Relative density (Water = 1) | 1.2 |
9.2. Other information

Not Available

SECTION 10 STABILITY AND REACTIVITY

10.1. Reactivity
See section 7.2

10.2. Chemical stability
Product is considered stable and hazardous polymerisation will not occur.

10.3. Possibility of hazardous reactions
See section 7.2

10.4. Conditions to avoid
See section 7.2

10.5. Incompatible materials
See section 7.2

10.6. Hazardous decomposition products
See section 5.3

SECTION 11 TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Route of Exposure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhaled</td>
<td>The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion. Accidental ingestion of the material may be damaging to the health of the individual.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>The material can produce chemical burns following direct contact with the skin. Open cuts, abraded or irritated skin should not be exposed to this material. 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.</td>
</tr>
<tr>
<td>Skin Contact</td>
<td>The material can produce chemical burns following direct contact with the skin.</td>
</tr>
<tr>
<td>Eye</td>
<td>The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.</td>
</tr>
<tr>
<td>Chronic</td>
<td>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Repeated or prolonged exposure to acids may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. The impact of inhaled acidic agents on the respiratory tract depends upon a number of interrelated factors. These include physicochemical characteristics, e.g., gas versus aerosol; particle size (small particles can penetrate deeper into the lung); water solubility (more soluble agents are more likely to be removed in the nose and mouth). Given the general lack of information on the particle size of aerosols involved in occupational exposures to acids, it is difficult to identify their principal deposition site within the respiratory tract. Acid mists containing particles with a diameter of up to a few micrometers will be deposited in both the upper and lower airways. They are irritating to mucous epithelia, they cause dental erosion, and they produce acute effects in the lungs (symptoms and changes in pulmonary function). Asthmatics appear to be at particular risk for pulmonary effects.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substance</th>
<th>Toxicity</th>
<th>Irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riva Star</td>
<td>Toxicity</td>
<td>Not Available</td>
</tr>
<tr>
<td>silver(l) fluoride</td>
<td>Toxicity</td>
<td>Not Available</td>
</tr>
<tr>
<td>ammonia</td>
<td>Toxicity</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**Riva Star**

**Toxicity**

Inhalation (rat) LC50: 2000 ppm/4h[2]

**Irritation**

Eye (rabbit): 0.25 mg SEVERE

**silver(l) fluoride**

**Toxicity**

Inhalation (rat) LC50: 2000 ppm/4h[2]

**Irritation**

Eye (rabbit): 0.25 mg SEVERE

**ammonia**

**Toxicity**

Inhalation (rat) LC50: 2000 ppm/4h[2]

**Irritation**

Eye (rabbit): 0.25 mg SEVERE

**Oral (rat) LD50: 350 mg/kgE[2]**

**Irritation**

Eye (rabbit): 1 mg/30s SEVERE

Continued...
### SECTION 12 ECOLOGICAL INFORMATION

#### 12.1. 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>ammonia</td>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>15mg/L</td>
<td>4</td>
</tr>
<tr>
<td>ammonia</td>
<td>NOEC</td>
<td>72</td>
<td>Fish</td>
<td>3.5mg/L</td>
<td>4</td>
</tr>
<tr>
<td>water</td>
<td>EC50</td>
<td>384</td>
<td>Crustacea</td>
<td>199.179mg/L</td>
<td>3</td>
</tr>
<tr>
<td>water</td>
<td>EC50</td>
<td>96</td>
<td>Algae or other aquatic plants</td>
<td>8768.674mg/L</td>
<td>3</td>
</tr>
<tr>
<td>water</td>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>897.520mg/L</td>
<td>3</td>
</tr>
</tbody>
</table>

**Legend:**
- Data available but does not fill the criteria for classification
- Data required to make classification available
- Data Not Available to make classification

**Extracted from** 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - Aquatic Toxicity Data (Estimated) 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.**

**DO NOT discharge into sewer or waterways.**

#### 12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>ammonia</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>water</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

**Legend:**
- Data available but does not fill the criteria for classification
- Data required to make classification available
- Data Not Available to make classification

#### 12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ammonia</td>
<td>LOW (LogKOW = 0.229)</td>
</tr>
<tr>
<td>water</td>
<td>LOW (LogKOW = -1.38)</td>
</tr>
</tbody>
</table>

#### 12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>ammonia</td>
<td>LOW (KOC = 14.3)</td>
</tr>
<tr>
<td>water</td>
<td>LOW (KOC = 14.3)</td>
</tr>
</tbody>
</table>

---

**SILVER(II) FLUORIDE**

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. No significant acute toxicological data identified in literature search.

**AMMONIA**

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. No significant acute toxicological data identified in literature search.

**WATER**

No significant acute toxicological data identified in literature search.
12.5. Results of PBT and vPvB assessment

<table>
<thead>
<tr>
<th>PBT criteria fulfilled?</th>
<th>P</th>
<th>B</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant available data</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

12.6. Other adverse effects

No data available

SECTION 13 DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.

<table>
<thead>
<tr>
<th>Waste treatment options</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewage disposal options</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

SECTION 14 TRANSPORT INFORMATION

Labels Required

- Marine Pollutant
- HAZCHEM 2R

Land transport (ADR)

14.1. UN number 2672
14.2. Packing group III
14.3. UN proper shipping name AMMONIA SOLUTION, relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia
14.4. Environmental hazard Not Applicable
14.5. Transport hazard class(es)
  - Class 8
  - Subrisk Not Applicable
  - Hazard identification (Kemler) 80
  - Classification code C5
  - Hazard Label 8
  - Special provisions 543
  - Limited quantity 5 L

Air transport (ICAO-IATA / DGR)

14.1. UN number 2672
14.2. Packing group III
14.3. UN proper shipping name Ammonia solution relative density (specific gravity) between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia
14.4. Environmental hazard Not Applicable
14.5. Transport hazard class(es)
  - ICAO / IATA Class 8
  - ICAO / IATA Subrisk Not Applicable
  - ERG Code 8L
14.6. Special precautions for user
  - Special provisions A64A803
  - Cargo Only Packing Instructions 856
  - Cargo Only Maximum Qty / Pack 60 L
Sea transport (IMDG-Code / GGVSee)

14.1. UN number 2672
14.2. Packing group III
14.3. UN proper shipping name AMMONIA SOLUTION, relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia
14.4. Environmental hazard Marine Pollutant
14.5. Transport hazard class(es) IMDG Class 8
IMDG Subrisk Not Applicable
14.6. Special precautions for user EMS Number F-A, S-B
Special provisions Not Applicable
Limited Quantities 5 L

Inland waterways transport (ADN)

14.1. UN number 2672
14.2. Packing group III
14.3. UN proper shipping name AMMONIA SOLUTION, relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia
14.4. Environmental hazard Not Applicable
14.5. Transport hazard class(es) 8 Not Applicable
14.6. Special precautions for user Classification code C5
Special provisions 543
Limited quantity 5 L
Equipment required PP, EP
Fire cones number 0

Transport in bulk according to Annex II of MARPOL and the IBC code
Not Applicable
If packed as Chemical kits the following classification may be considered if all ICAO/IATA transport requirements are met: Chemical Kit UN3316 - Class 9.

SECTION 15 REGULATORY INFORMATION

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

SILVER(I) FLUORIDE(7775-41-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS
## AMMONIA (1336-21-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs)
- European Customs Inventory of Chemical Substances ECICS (English)
- European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)
- European Union (EU) Commission Directive 2006/15/EC establishing a second list of indicative occupational exposure limit values (IOELVs)
- European Union (EU) Commission Directive 2006/15/EC establishing a second list of indicative occupational exposure limit values (IOELVs) (Spanish)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Bulgarian)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Czech)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Dutch)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (English)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Esperanto)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (French)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Finnish)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (German)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Greek)

EU Consolidated List of Indicative Occupational Exposure Limit Values (IOELVs) (Hungarian)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Italian)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Lithuanian)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Latvian)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Maltese)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Polish)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Portuguese)
- European Union (EU) First List of Indicative Occupational Exposure Limit Values (IOELVs) (Romanian)

## WATER (7732-18-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

EU REACH Regulation (EC) No 1907/2006 - Annex IV - Exemptions from the Obligation to Register in accordance with Article 2(7)(a) (English)
- European Customs Inventory of Chemical Substances ECICS (English)
- European Customs Inventory of Chemical Substances ECICS (Greek)

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable -:
- 67/548/EEC
- 99/45/EC
- 98/24/EC
- 86/767/EEC
- 94/33/EC
- 91/689/EEC
- 1999/13/EC
- Commission Regulation (EU) 2015/830
- Regulation (EC) No 1272/2008
- The Control of Substances Hazardous to Health Regulations (COSHH) 1999
- COSHH Essentials - The Management of Health and Safety at Work Regulations 1999

### 15.2. Chemical safety assessment

For further information please look at the Chemical Safety Assessment and Exposure Scenarios prepared by your Supply Chain if available.

### ECHA SUMMARY

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS number</th>
<th>Index No</th>
<th>ECHA Dossier</th>
</tr>
</thead>
<tbody>
<tr>
<td>silver(I) fluoride</td>
<td>7775-41-9</td>
<td>Not Available</td>
<td>01-2119513211-60-XXXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Harmonisation (C&amp;L Inventory)</th>
<th>Hazard Class and Category Code(s)</th>
<th>Pictograms Signal Word Code(s)</th>
<th>Hazard Statement Code(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Skin Corr. 1B</td>
<td>GHS05, Dgr</td>
<td>H314</td>
</tr>
<tr>
<td>2</td>
<td>Skin Corr. 1B, Acute Tox. 4, Eye Dam. 1</td>
<td>GHS05, Dgr, GHS09</td>
<td>H314, H312, H332</td>
</tr>
</tbody>
</table>

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.
### Ingredient | CAS number | Index No | ECHA Dossier |
--- | --- | --- | --- |
ammonia | 1336-21-6 | 007-001-01-2, 007-001-00-5 | 01-211948876-14-XXX |

#### Harmonisation (C&L Inventory) | Hazard Class and Category Code(s) | Pictograms Signal Word Code(s) | Hazard Statement Code(s) |
--- | --- | --- | --- |
1 | Skin Corr. 1B, Aquatic Acute 1, Flam. Gas 2, Acute Tox. 3 | GHS09, GHS05, Dgr, GHS06, GHS04 | H314, H221, H301 |

#### Ingredient | CAS number | Index No | ECHA Dossier |
--- | --- | --- | --- |
water | 7732-18-5 | Not Available | Not Available |

#### Harmonisation (C&L Inventory) | Hazard Class and Category Code(s) | Pictograms Signal Word Code(s) | Hazard Statement Code(s) |
--- | --- | --- | --- |
1 | Not Classified | GHS06, GHS05, Dgr, GHS02, Wng | H301, H226, H314 |
2 | Not Classified, Acute Tox. 3, Skin Corr. 1A, Acute Tox. 2, Flam. Liq. 3 | GHS06, GHS05, Dgr, GHS02, Wng | H301, H226, H314 |

#### National Inventory | Status |
--- | --- |
Australia - AICS | Y |
Canada - DSL | N (silver(I) fluoride) |
Canada - NDSL | N (ammonia; water) |
China - IECSC | N (silver(I) fluoride) |
Europe - EINEC / ELINCS / NLP | Y |
Japan - ENCS | N (water; silver(I) fluoride) |
Korea - KECI | Y |
New Zealand - NZIoC | Y |
Philippines - PICCS | N (silver(I) fluoride) |
USA - TSCA | Y |

**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

#### Full text Risk and Hazard codes

- **H221**: Flammable gas.  
- **H26**: Flammable liquid and vapour.  
- **H280**: Contains gas under pressure; may explode if heated.  
- **H301**: Toxic if swallowed.  
- **H302**: Harmful if swallowed.  
- **H304**: May be fatal if swallowed and enters airways.  
- **H311**: Toxic in contact with skin.  
- **H312**: Harmful in contact with skin.  
- **H318**: Causes serious eye damage.  
- **H330**: Fatal if inhaled.  
- **H331**: Toxic if inhaled.  
- **H332**: Harmful if inhaled.  
- **H35**: May cause respiratory irritation.  
- **H371**: May cause damage to organs.  
- **H373**: May cause damage to organs.  
- **R23/24/25**: Toxic by inhalation, in contact with skin and if swallowed.  
- **R35**: Causes severe burns.  
- **R41**: Risk of serious damage to eyes.
Other information

DSD / DPD label elements

Relevant risk statements are found in section 2.1

<table>
<thead>
<tr>
<th>Indication(s) of danger</th>
<th>N</th>
</tr>
</thead>
</table>

**SAFETY ADVICE**

- S01: Keep locked up.
- S02: Keep out of reach of children.
- S04: Keep away from living quarters.
- S20: When using do not eat or drink.
- S21: When using do not smoke.
- S23: Do not breathe gas/fumes/vapour/spray.
- S26: In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.
- S281: After contact with skin, wash immediately with detergent and plenty of water.
- S29: Do not empty into drains.
- S35: This material and its container must be disposed of in a safe way.
- S36: Wear suitable protective clothing.
- S37: Wear suitable gloves.
- S39: Wear eye/face protection.
- S40: To clean the floor and all objects contaminated by this material, use water and detergent.
- S45: In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).
- S56: Dispose of this material and its container at hazardous or special waste collection point.
- S57: Use appropriate container to avoid environmental contamination.
- S61: Avoid release to the environment. Refer to special instructions/Safety data sheets.
- S64: If swallowed, rinse mouth with water (only if the person is conscious).

**Ingredients with multiple cas numbers**

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
</tr>
</thead>
<tbody>
<tr>
<td>ammonia</td>
<td>1336-21-6, 14798-03-9</td>
</tr>
</tbody>
</table>

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.

For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:
- EN 166 Personal eye-protection
- EN 340 Protective clothing
- EN 374 Protective gloves against chemicals and micro-organisms
- EN 13832 Footwear protecting against chemicals
- EN 133 Respiratory protective devices

**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
- OISF: 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
- BCIF: 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

Continued...