MATERIAL SAFETY DATA SHEET
Part # PHFS-1047

SECTION I: GENERAL INFORMATION

PRODUCT NAME: Reference Fill Solution, 0.1M NH₄Cl & Saturated Ag

CHEMICAL NAME: Ammonium Chloride/Silver Chloride in Water

CHEMICAL FAMILY: salt solution

DOT SHIPPING INFO: none

IATA SHIPPING INFO: none

SECTION II: INGREDIENTS

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>%</th>
<th>CHEMICAL NAME(S)</th>
<th>LD₅₀ (mg/kg)</th>
<th>OSHA/PEL oral-rat</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>12125-02-9</td>
<td>0.5%</td>
<td>Ammonium Chloride</td>
<td>1650</td>
<td>20 mg/m³</td>
<td></td>
</tr>
<tr>
<td>7783-90-6</td>
<td>0.001%</td>
<td>Silver Chloride</td>
<td>330</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>7732-18-5</td>
<td>99.049%</td>
<td>Water</td>
<td>-</td>
<td>none</td>
<td></td>
</tr>
</tbody>
</table>

SECTION III: PHYSICAL DATA

| BOILING POINT: | 100°C |
| SPECIFIC GRAVITY: | 1.03 |
| VAPOR PRESSURE: | N/A |
| FREEZING POINT: | -4°C |
| VAPOR DENSITY: | N/A |
| pH: | 5-8 |
| WATER SOLUBILITY: | Soluble |
| APPEARANCE & ODOR: | Clear, odorless liquid |

SECTION IV: FIRE & EXPLOSION HAZARD DATA

FLASHPOINT: Not flammable
AUTOIGNITION TEMPERATURE: N/A
EXTINGUISHING MEDIA: Any

SPECIAL FIRE FIGHTING PROCEDURES: Self contained breathing apparatus should be worn.

UNUSUAL FIRE & EXPLOSION HAZARDS: N/A
SECTION V: HEALTH HAZARD DATA
EFFECTS OF OVEREXPOSURE:  Respiratory and stomach ailments.
EMERGENCY & FIRST AID:
EYES & SKIN:  Skin-wash off with water.  Eyes-irrigate with water lifting the eye lids occasionally.
INGESTION/INHALATION:  Dilute with large amount of water and consult a physician.

SECTION VI: REACTIVITY DATA
STABLE:  yes
CONDITIONS TO AVOID:  Heat or flame
INCOMPATIBILITY:  Oxidizers, Br, F, KClO₃, hypochlorite bleaches, NH₃, NO,
HAZARDOUS DECOMPOSITION PRODUCTS:  Emits toxic fumes when heated to decomposition.
HAZARDOUS POLYMERIZATION:  Will not occur.

SECTION VII: SPILL OR LEAK PROCEDURES
STEPS TO BE TAKEN:  Vacuum up and set aside for waste disposal.
WASTE DISPOSAL METHOD:  Observe all federal, state, and local laws when disposing of this product.

SECTION VIII: SPECIAL PROTECTION INFORMATION
RESPIRATORY PROTECTION:  N/A
VENTILATION:  N/A
PROTECTIVE GLOVES:  N/A
EYE PROTECTION:  Safety goggles
OTHER PROTECTIVE EQUIPMENT:  Lab coat

SECTION IX: SPECIAL PRECAUTIONS
PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE:  Keep well sealed and store away from heat or oxidizers.  Ammonium Chloride is a CERCLA hazard and is subject to reporting under Section 304 of SARA Title III.
OTHER PRECAUTIONS:  No eating or drinking while working with this product.  NFPA Rating (0-4):  Health-1, Fire-0, Reactivity-0, Specific-none.

ISSUE DATE:  April 17, 2003