1. PRODUCT AND COMPANY IDENTIFICATION

SILVADUR™ 961 Antimicrobial

Revision Date: 08/08/2012

Supplier
ROHM AND HAAS CHEMICALS LLC
A Subsidiary of The Dow Chemical Company
100 INDEPENDENCE MALL WEST
PHILADELPHIA, PA 19106-2399 United States

For non-emergency information contact: 215-592-3000

Emergency telephone number 1 800 424 9300
Local emergency telephone number 989-636-4400

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2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylic polymer(s)</td>
<td>Not hazardous</td>
<td>5.0 - 25.0 %</td>
</tr>
<tr>
<td>Silver nitrate</td>
<td>7761-88-8</td>
<td>0.5 - 6.0 %</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>7697-37-2</td>
<td>12.0 - 28.0 %</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>50.0 - 80.0 %</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance
Form     liquid clear
Colour   yellow

Hazard Summary
DANGER!
CORROSION TO EYES
CAUSES SEVERE SKIN IRRITATION.
HARMFUL IF SWALLOWED.
Potential Health Effects

Primary Routes of Entry:  
Inhalation  
Eye contact  
Skin contact

Eyes: Material can cause the following:  
corrosion to eyes  
corneal burns  
permanent eye injury

Skin: Material can cause the following:  
Severe irritation

Ingestion: Harmful if swallowed.

Inhalation: Inhalation of solvent vapor or mist can cause the following:  
irritation of nose, throat, and lungs

4. FIRST AID MEASURES

Inhalation: Move to fresh air. Give artificial respiration if breathing has stopped. Get prompt medical attention. In case of shortness of breath, give oxygen.

Skin contact: IMMEDIATELY get under a safety shower. Remove contaminated clothing. Wash off with soap and plenty of water. Get prompt medical attention. Wash contaminated clothing before re-use. Do not take clothing home to be laundered.

Eye contact: Rinse immediately with plenty of water for at least 15 minutes. Get prompt medical attention.

Ingestion: Drink 1 or 2 glasses of water. IMMEDIATELY see a physician. If vomiting occurs spontaneously, keep airway clear. Never give anything by mouth to an unconscious person.

5. FIREFIGHTING MEASURES

Flash point  
Noncombustible

Lower explosion limit  
not applicable

Upper explosion limit  
not applicable

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.

Specific hazards during firefighting: Closed containers may rupture via pressure build-up when exposed to fire or extreme heat. During a fire, irritating and highly toxic gases and/or fumes may be generated during combustion or decomposition.

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus.
Further information: Move containers promptly out of fire zone. If removal is impossible, cool containers with water spray.
Remain upwind.
Avoid breathing smoke.
Contain run-off.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Appropriate protective equipment must be worn when handling a spill of this material. See SECTION 8, Exposure Controls/Personal Protection, for recommendations.
If exposed to material during clean-up operations, IMMEDIATELY remove all contaminated clothing and wash exposed skin areas with soap and water. See SECTION 4, First Aid Measures, for further information.
Do not take clothing home to be laundered.

Environmental precautions
WARNING: KEEP SPILLS AND CLEANING RUNOFFS OUT OF MUNICIPAL SEWERS AND OPEN BODIES OF WATER.

Methods for cleaning up
Evacuate personnel to safe areas.
Ventilate the area.
Floor may be slippery; use care to avoid falling.
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Sweep up or vacuum up spillage and collect in suitable container for disposal.
Avoid breathing vapor.
Avoid all contact.

7. HANDLING AND STORAGE

Handling
Appropriate protective equipment must be worn when handling a spill of this material. See SECTION 8, Exposure Controls/Personal Protection, for recommendations. Vapors can be evolved when material is heated during processing operations. See SECTION 8, Exposure Controls/Personal Protection, for types of ventilation required.
Wash after handling and shower at end of work period.

Storage
Storage conditions: Avoid temperature extremes during storage; ambient temperature preferred.
Store out of direct sunlight in a cool place. Keep containers tightly closed in a cool, well-ventilated place.
Storage temperature: 1 - 49 °C (34 - 120 °F)
Further information:
CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all MSDS and label warnings even after container is emptied.
Improper disposal or re-use of this container may be dangerous and illegal. Refer to applicable local, state and federal regulations.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit(s)

Exposure limits are listed below, if they exist.

<table>
<thead>
<tr>
<th>Component</th>
<th>Regulation</th>
<th>Type of listing</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver nitrate</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>0.01 mg/m³, Silver</td>
</tr>
<tr>
<td>Silver nitrate</td>
<td>ACGIH</td>
<td>TWA</td>
<td>0.01 mg/m³, Silver</td>
</tr>
<tr>
<td>Silver nitrate</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>0.01 mg/m³, Silver</td>
</tr>
<tr>
<td>Silver nitrate</td>
<td>NIOSH REL</td>
<td>TWA</td>
<td>0.01 mg/m³, Silver</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>ACGIH</td>
<td>TWA</td>
<td>2 ppm</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>OSHA P1</td>
<td>TWA</td>
<td>5 mg/m³, 2 ppm</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>OSHA P0</td>
<td>TWA</td>
<td>5 mg/m³, 2 ppm</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>OSHA P0</td>
<td>STEL</td>
<td>10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>NIOSH REL</td>
<td>TWA</td>
<td>5 mg/m³, 2 ppm</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>NIOSH REL</td>
<td>ST</td>
<td>10 mg/m³, 4 ppm</td>
</tr>
</tbody>
</table>

Exposure controls

**Engineering measures**: Use local exhaust ventilation with a minimum capture velocity of 100 ft/min. (0.5 m/sec.) at the point of vapor evolution. Refer to the current edition of Industrial Ventilation: A Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

**Protective measures**: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

**Individual protection measures**

**Eye/face protection**: Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Eye protection worn must be compatible with respiratory protection system employed.

**Skin protection**

**Hand protection**: Chemical-resistant gloves should be worn whenever this material is handled. The glove(s) listed below may provide protection against permeation. (Gloves of other chemically resistant materials may not provide adequate protection): Nitrile rubber Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough. Rinse and remove gloves immediately after use. Wash hands with soap and water.

**Other protection**: Use chemically resistant apron or other impervious clothing to avoid prolonged or repeated skin contact. Where splashing is possible, full chemically resistant protective clothing (e.g. acid suit) and boots are required.

**Respiratory protection**: A respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements or equivalent must be followed whenever workplace conditions warrant a respirator’s use. None required if airborne concentrations are maintained below the exposure limit listed in Exposure Limit Information. Up to 10 times the exposure limit: Wear a properly fitted NIOSH approved (or equivalent) half-mask, air-purifying respirator. Up to 50 times the exposure limit: Wear a properly fitted NIOSH approved (or equivalent) full-facepiece, air-
purifying respirator, OR full-facepiece, airline respirator in the pressure demand mode. Above 50 times the exposure limit or Unknown: Wear a properly fitted NIOSH approved (or equivalent) self-contained breathing apparatus in the pressure demand mode, OR full-facepiece, airline respirator in the pressure demand mode with emergency escape provision. Air-purifying respirators should be equipped with NIOSH approved (or equivalent) organic vapor cartridges and N95 filters. If oil mist is present, use R95 or P95 filters.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid clear</td>
</tr>
<tr>
<td>Form</td>
<td>Liquid clear</td>
</tr>
<tr>
<td>Colour</td>
<td>Yellow</td>
</tr>
<tr>
<td>pH</td>
<td>2.2 - 4.0</td>
</tr>
<tr>
<td>Flash point</td>
<td>Noncombustible</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>&lt;1 Water</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>17.0 mmHg at 20 °C (68 °F) Water</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>&lt;1.0 Water</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Soluble</td>
</tr>
<tr>
<td>Percent volatility</td>
<td>50 - 80 % Water</td>
</tr>
</tbody>
</table>

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions: This material is considered stable.

Materials to avoid: Avoid contact with the following: Strong Oxidizers Bases

Hazardous decomposition products: Thermal decomposition may yield the following: nitrogen oxides (NOx), acrylic monomers, Metal oxides,

polymerisation: Product will not undergo polymerization.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute oral toxicity: LD50 Oral rat female 3,129 mg/kg

Swallowing may result in gastrointestinal irritation.
Acute inhalation toxicity
LC50 rat male and female 4 Hour > 5.71 mg/l
Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs.
Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.

Acute dermal toxicity
LD50 Dermal rat male and female > 5,000 mg/kg

Skin irritation
rabbit Severe skin irritation

Eye irritation
rabbit Corrosive

Sensitisation
guinea pig Did not cause sensitization on laboratory animals.

Component: **Nitric acid**
Subchronic toxicity
In animals, effects have been reported on the following organs:
Respiratory tract.
lung
Can cause erosion of the teeth.

Component: **Water**
Subchronic toxicity
No adverse effect has been observed in chronic toxicity tests.

Component: **Water**
Carcinogenicity: Did not cause cancer in laboratory animals.

Component: **Water**
Reproductive toxicity
In animal studies, did not interfere with reproduction.

Component: **Water**
Teratogenicity
No relevant information found.

Component: **Water**
Mutagenicity
In vitro mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.
There is no data available for this product.

**Silver nitrate**
Elimination information (persistence and degradability)
Biodegradability
no data available

Bioaccumulation
no data available

Ecotoxicity effects
Toxicity to fish
LC50 Fathead minnow (Pimephales promelas) 96 Hour OECD Test Guideline 203 or Equivalent
0.0056 mg/l

Toxicity to algae
EC50 Algae 72 Hour Method Not Specified
2 mg/l

Toxicity to aquatic invertebrates
EC50 Daphnia magna 48 Hour OECD Test Guideline 202 or Equivalent
0.0084 mg/l

13. DISPOSAL CONSIDERATIONS

Environmental precautions: WARNING: KEEP SPILLS AND CLEANING RUNOFFS OUT OF MUNICIPAL SEWERS AND OPEN BODIES OF WATER.

Disposal
Waste Classification: 40 CFR 261.20 - .24 - Characteristic Waste Silver (D011)
For disposal, incinerate this material at a facility that complies with local, state, and federal regulations. (See 40 CFR 268)

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

DOT

Proper shipping name  Corrosive liquid, acidic, inorganic, n.o.s.(Nitric acid, Silver nitrate)
UN number  UN 3264
Class  8
Packing group  II
Reportable Quantity  Silver nitrate

Classification for SEA transport (IMO-IMDG):

Proper shipping name  CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.(Nitric acid, Silver nitrate)
UN number  UN 3264
Class  8
Packing group  II
Marine pollutant  Silver nitrate
Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations.

## 15. REGULATORY INFORMATION

### Workplace Classification

**OSHA:** This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**WHMIS:** This product is a ‘controlled product’ under the Canadian Workplace Hazardous Materials Information System (WHMIS).

### SARA TITLE III: Section 311/312 Categorizations (40CFR370): Acute Health Hazard

### SARA TITLE III: Section 313 Information (40CFR372)

<table>
<thead>
<tr>
<th>SARA Title III Components</th>
<th>7761-88-8</th>
<th>7697-37-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver nitrate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitric acid</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CERCLA Information (40CFR302.4)

This material has a reportable quantity under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304. The material’s hazardous waste number and reportable quantity is listed below. Releases of this material in excess of its reportable quantity must be reported to the National Response Center (1-800-424-8802) and to the appropriate state and local emergency response organizations.

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS No.</th>
<th>Reportable Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver nitrate</td>
<td>7761-88-8</td>
<td>1 lbs RQ</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>7697-37-2</td>
<td>1000 lbs RQ</td>
</tr>
</tbody>
</table>

### United States TSCA Inventory (US.TSCA): This product contains at least one component that is not listed (and is not excluded from listing) on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory, and therefore can be used only for research and development purposes under the conditions described in the Code of Federal Regulations at 40 CFR 720.36.

### Pennsylvania

Any material listed as “Not Hazardous” in the CAS REG NO. column of SECTION 2, Composition/Information On Ingredients, of this MSDS is a trade secret under the provisions of the Pennsylvania Worker and Community Right-to-Know Act.

## 16. OTHER INFORMATION

### HMIS Hazard Rating

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
<th>Physical Hazard</th>
<th>PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Legend**

- **ACGIH**: American Conference of Governmental Industrial Hygienists
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAc</td>
<td>Butyl acetate</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>STEL</td>
<td>Short Term Exposure Limit (STEL):</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>TWA</td>
<td>Time Weighted Average (TWA):</td>
</tr>
<tr>
<td>Bar</td>
<td>Bar denotes a revision from prior MSDS.</td>
</tr>
</tbody>
</table>

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