Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard.
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

Identity (As used on Label and List)
ALUMINUM ETCHANT TYPE A

Section I

Manufacturer's Name
TRANSENE COMPANY INC.

Address (Number, Street, City, State and ZIP Code)
10 ELECTRONICS AVENUE

DANVERS INDUSTRIAL PARK
DANVERS MA 01923

Section II - Hazardous Ingredients / Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>Other Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHOSPHORIC ACID H₃PO₄</td>
<td>CAS 7664-38-2</td>
<td>1.0 mg/M³</td>
<td>80 %</td>
<td></td>
</tr>
<tr>
<td>NITRIC ACID HN0₃</td>
<td>CAS 7697-37-2</td>
<td></td>
<td>ACGIH TLV: 2ppm (TWA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4ppm (STEL)</td>
<td></td>
</tr>
<tr>
<td>ACETIC ACID C₂H₄0₂</td>
<td>CAS 64-19-7</td>
<td></td>
<td>2 ppm</td>
<td>5 %</td>
</tr>
<tr>
<td>BALANCE DISTILLED WATER</td>
<td>NON HAZARDOUS</td>
<td></td>
<td>10 ppm</td>
<td>5 %</td>
</tr>
</tbody>
</table>

ALL THE ABOVE INGREDIENTS ARE ALL LISTED IN THE TSCA INVENTORY LIST.

Section III - Physical / Chemical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point (°C)</td>
<td>100</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.45</td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg)</td>
<td>N/A</td>
</tr>
<tr>
<td>Melting Point</td>
<td>...</td>
</tr>
<tr>
<td>Vapor Density (AIR = 1)</td>
<td>N/A</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>N/A</td>
</tr>
<tr>
<td>(Butyl Acetate = 1)</td>
<td></td>
</tr>
<tr>
<td>Solubility in Water at 20°C</td>
<td>Miscible</td>
</tr>
</tbody>
</table>

Appearance and Odor  CLEAR, COLORLESS, SYRUPY LIQUID, ODORLESS

Section IV - Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point (Method Used)</td>
<td>NON-FLAMMABLE</td>
</tr>
<tr>
<td>Flammable Limits</td>
<td>NOT</td>
</tr>
<tr>
<td>LEL</td>
<td>-----</td>
</tr>
<tr>
<td>UEL</td>
<td>-----</td>
</tr>
</tbody>
</table>

Extinguishing Media  WATER SPRAY, DRY CHEMICAL, OR FOAM. CONTACT WITH COMMON METALS PRODUCES HYDROGEN (H₂) WHICH MAY FORM FLAMMABLE MIXTURES WITH AIR UNDER CONDITIONS OF FIRE, TOXIC VAPORS MAY FORM, CORROSIVE LIQUID!

Special Fire Fighting Procedures  WEAR SELF-CONTAINED BREATHING APPARATUS DURING THE FIRE AND PROTECT SKIN FROM VAPORS OR MIST.
Section V - Reactivity Data

Stability

Unstable

Stable X

Conditions to Avoid

AVOID CONTACT WITH COMMON METALS, STRONG BASES, OXIDIZERS AND COMBUSTIBLE ORGANICS.

Incompatibility (Materials to Avoid)

STRONG BASES, OXIDIZERS, MOST METALS AND COMBUSTIBLE ORGANICS.

Hazardous Decomposition or Byproducts

VARIOUS OXIDES OF PHOSPHORUS, NITROGEN & SOME CARBON DIOXIDE(CO2)

Section VI - Health Hazard Data

Route(s) of Entry:

Inhalation? YES

Skin? YES

Ingestion? YES

Health Hazards (Acute and Chronic)

SOLUTION IS MODERATELY IRRITATING TO THE EYES, SKIN, AND MUCOUS MEMBRANES.

CONCENTRATED SOLUTIONS MODERATELY TOXIC BY INGESTION.

DIRECT CONTACT CAN CAUSE SEVERE BURNS. PERSONS WITH PRE-EXISTING SKIN DISORDERS OR DISEASE MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS SUBSTANCE.

Carcinogenicity

NTP? N/A

IARC Monographs? N/A

OSHA Regulated? N/A

Signs And Symptoms of Exposure

EYE CONTACT: FLOOD WITH EXCESS OF WATER FOR AT LEAST 15 MINUTES. CONTACT A PHYSICIAN

SKIN CONTACT: FLOOD WITH WATER & COVER WITH MOIST BAKING SODA. CONTACT A PHYSICIAN

INHALATION: REMOVAL TO CLEAN AIR IS USUALLY SUFFICIENT. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. CONTACT A PHYSICIAN.

INGESTION: DO NOT INDUCE VOMITING! GIVE WATER WITH MILK OF MAGNESIA OR BEATEN

Medical Conditions

SEE SIGNS & SYMPTOMS OF EXPOSURE

Generally Aggravated by Exposure N/A

First Aid:

EYE CONTACT: FLOOD WITH EXCESS OF WATER FOR AT LEAST 15 MINUTES. CONTACT A PHYSICIAN

SKIN CONTACT: FLOOD WITH WATER & COVER WITH MOIST BAKING SODA. CONTACT A PHYSICIAN

INHALATION: REMOVAL TO CLEAN AIR IS USUALLY SUFFICIENT. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. CONTACT A PHYSICIAN.

INGESTION: DO NOT INDUCE VOMITING! GIVE WATER WITH MILK OF MAGNESIA OR BEATEN

Section VII - Precautions For Safe Handling And Use

Steps to Be Taken in Case Material is Released or Spilled

COVER CONTAMINATED AREA WITH SODA ASH, SLAKED LIME MIXTURE (50:50) MIX AND ADD WATER TO FORM A SLURRY. SCOOP UP SLURRY AND SAVE FOR DISPOSAL.

Waste Disposal Method

ADD ABOVE SLURRY OF MIXTURE (AS IS) SLOWLY TO A LARGE VOLUME OF SODA ASH SOLUTION WITH AGITATION. NEUTRALIZE AND FLUSH TO SEWER WITH RUNNING WATER IN A CONCENTRATION PERMITTED BY LOCAL, STATE AND FEDERAL REGULATIONS.

Precautions to be taken in handling and storing

PROTECT CONTAINERS AGAINST PHYSICAL DAMAGE. STORE IN COOL, DRY, WELL VENTILATED LOCATION, AWAY FROM AREA WHERE FIRE HAZARDS MAY BE ACUTE. KEEP AWAY FROM OXIDIZERS AND BASES. PROTECT UNITS FROM DIRECT SUNLIGHT. LOOSEN CONTAINER CAUTIOUSLY.

Other Precautions

VENTILATION: A SYSTEM OF LOCAL EXHAUST IS RECOMMENDED TO KEEP EMPLOYEE EXPOSURES BELOW THE AIRBORNE EXPOSURE LIMITS. LOCAL EXHAUST VENTILATION IS GENERALLY PREFERRED BECAUSE IT CAN CONTROL THE EMISSIONS OF THE DUST OR VAPOR AT ITS SOURCE PREVENTING DISPERSION INTO THE GENERAL WORK AREA. REFER TO ACGIH DOCUMENT, "INDUSTRIAL VENTILATION, A MANUAL OF RECOMMENDED PRACTICES" FOR DETAILS.

Section VIII - Control Measures

Respiratory Protection (Specify Type)

ORGANIC VAPORS/ACID GASES (NIOSH APPROVED). HN03 IS AN OXIDIZER AND SHOULD NOT COME IN CONTACT WITH CARTRIDGES AND CANISTERS THAT CONTAIN OXIDIZABLE MATERIALS, SUCH AS ACTIVATED CHARCOAL.

Ventilation

Local Exhaust X

Mechanical (General)

Other

Protective Gloves

VITON WITH COTTON LINING

Eye Protection

FACE SHIELD OR SPLASH-PROOF GOGGLES DO NOT WEAR CONTACT LENSES WHEN WORKING WITH THIS PRODUCT.

Other Protective Clothing or Equipment

LAB COAT, COVERALLS, OR APRON.

Work/Hygenic Practices

HANDLE WITH CARE. WASH AFTER HANDLING.
# Addendum to Material Safety Data Sheet

## REGULATORY STATUS

<table>
<thead>
<tr>
<th>Hazard Categories for SARA Section 311/312 Reporting</th>
<th>Acute</th>
<th>Chronic</th>
<th>Fire</th>
<th>Pressure</th>
<th>Reactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA EHS Sec. 302 RQ (lbs.)</td>
<td>TPO (lbs.)</td>
<td>Name List</td>
<td>Chemical Category</td>
<td>CERCLA Sec. 103 RQ (lbs.)</td>
<td>RCRA Sec. 261.23</td>
</tr>
<tr>
<td>1000</td>
<td>1000</td>
<td>Yes</td>
<td>No</td>
<td>1000</td>
<td>No</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>5000</td>
<td>No</td>
</tr>
</tbody>
</table>

### SARA Section 302 EHS RQ:
- Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

### SARA Section 302 EHS TPO:
- Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.

### SARA Section 311 Chemicals:
- Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

### CERCLA Section 103:
- Comprehensive Environmental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800)-424-8802; Listed at 40 CFR 302.4

### RCRA:
- Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as hazardous listed in 40 CFR 261.23

Effective Date: 02-17-87 Supersedes 04-30-86