SAFETY DATA SHEET

1. Identification

Product identifier: EX-88- Hardener

Other means of identification:
- SDS number: 01188, 01288, 01287, 01179, 01183, 01488, 01189, 01188R, 120
- Recommended use: High Gloss Coating
- Recommended restrictions: None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer:
- Company name: Environmental Technology, Inc.
- Address: 300 S. Bay Depot Road, Fields Landing, CA 95537, USA.
- Telephone number: 001 707-443-9323
- E-mail: mail@eti-usa.com
- Contact person: Technical Director
- Emergency phone number: 800-424-9300 (CHEMTREC)

2. Hazard identification

Physical hazards:
- Acute toxicity, oral: Category 4

Health hazards:
- Skin corrosion/irritation: Category 1
- Serious eye damage/eye irritation: Category 1
- Sensitization, skin: Category 1
- Reproductive toxicity: Category 2

Label elements:
- Signal word: Danger
- Hazard statement: Harmful if swallowed. Causes severe skin burns and eye damage. May cause an allergic skin reaction. Suspected of damaging fertility. Suspected of damaging the unborn child.

Precautionary statement:

Prevention:
- Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist or vapour. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response:
- IF SWALLOWED: rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE/doctor. Wash contaminated clothing before reuse.

Storage:
- Store locked up.

Disposal:
- Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards:
- None known.

Supplemental information:
- None known.
3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Piperazin-1-yethly lamine</td>
<td></td>
<td>140-31-8</td>
<td>3-7% wt/wt</td>
</tr>
<tr>
<td>Alkyl Ether Amine</td>
<td></td>
<td>39423-51-3</td>
<td>7-13% wt/wt</td>
</tr>
<tr>
<td>Nonylphenol</td>
<td></td>
<td>84852-15-3</td>
<td>40-70% wt/wt</td>
</tr>
<tr>
<td>Polyoxypropylenediamine</td>
<td></td>
<td>9046-10-0</td>
<td>15-40% wt/wt</td>
</tr>
</tbody>
</table>

Composition comments

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

The exact concentrations of the above listed chemicals are being withheld as a trade secret.

4. First-aid measures

Inhalation

If inhaled, remove to fresh air. For breathing difficulties, oxygen may be necessary. Get medical attention immediately.

Skin contact

Remove contaminated clothing. Rinse skin thoroughly with lukewarm water for at least 15 minutes. Call a physician or poison control centre immediately. Wash contaminated clothing before reuse.

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control centre immediately.

Ingestion

Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Call a physician or Poison Control Centre immediately. Never give anything by mouth to a victim who is unconscious or is having convulsions.

Most important symptoms/effects, acute and delayed

Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. May cause an allergic skin reaction. Dermatitis. Rash. Contact can cause corrosive burns, corneal damage, and blindness. Itching, redness, swelling, burning or blistering of skin.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed. Exposure may aggravate pre-existing skin disorders.

5. Fire-fighting measures

Suitable extinguishing media

Water fog. Alcohol resistant foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media

Water. Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed such as: Carbon oxides (COx). Nitrogen Oxides

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions

In case of fire do not breath fumes. Move container from fire area if it can be done without risk.

Specific methods

Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards

No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Do not breathe mist or vapour. Avoid contact with skin and eyes. Keep unnecessary personnel away. Keep out of low areas. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Keep unnecessary personnel away. This product is miscible in water. Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Collect and dispose of spillage as indicated in section 13 of the SDS. Prevent entry into waterways, sewer, basements or confined areas.

Never return spills to original containers for re-use.
Environmental precautions
Avoid discharge into drains, water courses or onto the ground. Contact local authorities in case of spillage to drain/aquatic environment.

7. Handling and storage
Precautions for safe handling
Do not handle until all safety precautions have been read and understood. Do not breathe mist or vapour. Do not get this material in your eyes, on your skin, or on your clothing. Avoid contact during pregnancy/while nursing. Provide adequate ventilation. Use personal protective equipment as required. Wash contaminated clothing before reuse. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Avoid release to the environment. Keep out of reach of children.

Conditions for safe storage, including any incompatibilities
Keep out of the reach of children. Store locked up. Store in tightly closed original container in a dry, cool and well-ventilated place. Store away from incompatible materials, see Section 10 of the SDS.

8. Exposure controls/personal protection
Occupational exposure limits
No exposure limits noted for ingredient(s).

Biological limit values
No biological exposure limits noted for the ingredient(s).

Exposure guidelines
No exposure standards allocated. Use personal protective equipment as required. Keep working clothes separately.

Appropriate engineering controls
Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment
Eye/face protection
Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection
Hand protection
Chemical resistant gloves. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material.

Other
Respiratory protection
If ventilation is insufficient, suitable respiratory protection must be provided.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations
When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace. Wash at the end of each work shift and before eating, smoking or using the toilet.

9. Physical and chemical properties
Appearance
Viscous liquid.

Physical state
Liquid.

Form
Pourable liquid.

Colour
Clear.

Odour

Odour threshold
Not available.

pH
>= 11.7

Melting point/freezing point
Not available.

Initial boiling point and boiling range
Not available.

Flash point
> 121.0 °C (> 249.8 °F) Closed cup

Evaporation rate
Not available.

Flammability (solid, gas)
Not applicable.

Upper/lower flammability or explosive limits
Flammability limit - lower (%)
Not available.

Flammability limit - upper (%)
Not available.

Explosive limit - lower (%) Not available.
Explosive limit – upper (%)
Not available.

Vapour pressure
Not available.

Vapour density
> 1 (Air = 1)

Relative density
1.15

Solubility(ies)
- Solubility (water) Slightly soluble (0.1-1%)

Partition coefficient (n-octanol/water)
Not available.

Auto-ignition temperature
Not available.

Decomposition temperature
Not available.

Viscosity
Not available.

Other information
- Explosive properties Not explosive.
- Oxidising properties Not oxidising.

10. Stability and reactivity

Reactivity
The product is stable and non-reactive under normal conditions of use, storage and transport. Read and follow manufacturer's recommendations.

Chemical stability
Stable under normal temperature conditions and recommended use.

Possibility of hazardous reactions
Hazardous polymerisation does not occur.

Conditions to avoid
Avoid temperatures exceeding the flash point. Reacts violently with strong acids. This product may react with oxidizing agents. Do not mix with other chemicals. Avoid incompatible materials and intense heat.

Incompatible materials

Hazardous decomposition products
None expected under normal conditions of use.

11. Toxicological information

Information on likely routes of exposure

- Inhalation
  Under normal conditions of intended use, this material is not expected to be an inhalation hazard. When heated, the vapours/fumes given off may cause respiratory tract irritation.

- Skin contact
  Causes severe skin burns. May cause an allergic skin reaction. May be harmful if absorbed through skin.

- Eye contact
  Causes eye burns. Causes serious eye damage.

- Ingestion
  Causes digestive tract burns. Harmful if swallowed. Under normal conditions of intended use, this material does not pose a risk to health.

Symptoms related to the physical, chemical and toxicological characteristics
Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. May cause an allergic skin reaction. Dermatitis. Rash. Contact can cause corrosive burns, corneal damage, and blindness. Itching, redness, swelling, burning or blistering of skin.

Information on toxicological effects
Acute toxicity
Harmful if swallowed. May be harmful if absorbed through skin. May cause digestive tract burns.

Components | Species | Test Results
--- | --- | ---
2-Piperazin-1-ylethy lamine (CAS 140-31-8) | | 
**Acute** |  | 
Dermal | Rabbit | 880 mg/kg
LD50 |  | 
Oral | Rat | > 1000 mg/kg
LD50 |  | 
Nonylphenol (CAS 84852-15-3) | | 
**Acute** |  | 
Dermal | Rabbit | 2031 mg/kg
LD50 |  |
### Test Results

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>Rat</td>
<td>1200 mg/kg</td>
</tr>
</tbody>
</table>

**Skin corrosion/irritation**
- Corrosive to skin and eyes. Causes severe skin burns and eye damage.
- Causes eye burns. Causes serious eye damage.

**Respiratory or skin sensitisation**
- **Respiratory sensitisation**: Due to partial or complete lack of data the classification is not possible.
- **Skin sensitisation**: May cause an allergic skin reaction.
- **Germ cell mutagenicity**: No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
- **Carcinogenicity**: This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
- **Reproductive toxicity**: Possible reproductive hazard. Possible risk of harm to the unborn child. Possible risk of impaired fertility.
- **Specific target organ toxicity - single exposure**: Not classified.
- **Specific target organ toxicity - repeated exposure**: Not classified.
- **Aspiration hazard**: Due to the high viscosity the product is not an aspiration hazard.
- **Chronic effects**: Prolonged exposure may cause chronic effects. Possible adverse reproductive and developmental effects.

**Further information**
- Reproductive toxicity. Symptoms may be delayed. May cause allergic respiratory and skin reactions.

### 12. Ecological information

**Ecotoxicity**
- Expected to be very toxic to aquatic organisms. May cause long-term adverse effects in the environment.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Piperazin-1-ylethy lamine (CAS 140-31-8)</td>
<td>Aquatic</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Fathead minnow (Pimephales promelas)</td>
</tr>
<tr>
<td>Nonylphenol (CAS 84852-15-3)</td>
<td>Aquatic</td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algae</td>
<td>EC50</td>
<td>Scenedesmus subspicatus</td>
</tr>
<tr>
<td>Crustacea</td>
<td>EC50</td>
<td>Daphnia magna</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Pimephales promelas</td>
</tr>
<tr>
<td><strong>Chronic</strong></td>
<td></td>
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<tr>
<td>Crustacea</td>
<td>NOEC</td>
<td>Daphnia magna</td>
</tr>
<tr>
<td>Fish</td>
<td>NOEC</td>
<td>Pimephales promelas</td>
</tr>
<tr>
<td>Polyoxypropylene diamine (CAS 9046-10-0)</td>
<td>Aquatic</td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algae</td>
<td>NOEC</td>
<td>Algae</td>
</tr>
<tr>
<td><strong>Chronic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algae</td>
<td>NOEC</td>
<td>Algae</td>
</tr>
</tbody>
</table>

**Persistence and degradability**
- No data is available on the degradability of this product.

**Bioaccumulative potential**
- **Partition coefficient n-octanol / water (log Kow)**
  - Nonylphenol (CAS 84852-15-3): 5.71

**Mobility in soil**
- No data available.

**Other adverse effects**
- None known.

### 13. Disposal considerations
- Dispose in accordance with applicable federal, state, and local regulations. Do not allow this material to drain into sewers/water supplies.
Dispose in accordance with applicable regulations.

**Local disposal regulations**

**Hazardous waste code**
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**Waste from residues / unused products**
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

**Contaminated packaging**
Dispose in accordance with applicable federal, state, and local regulations.

### 14. Transport information

**TDG**

- **UN number**: UN1760
- **UN proper shipping name**: Corrosive liquids, n.o.s. (Nonyl Phenol Mixture)
- **Transport hazard class(es)**
  - **Class**: 8
  - **Subsidiary risk**: -
  - **Label(s)**: 8
- **Packing group**: III
- **Environmental hazards**: Yes
- **Special precautions for user**: Read safety instructions, SDS and emergency procedures before handling.

**IATA**

- **UN number**: UN1760
- **UN proper shipping name**: Corrosive liquids, n.o.s. (Nonyl Phenol Mixture)
- **Transport hazard class(es)**
  - **Class**: 8
  - **Subsidiary risk**: -
  - **Label(s)**: 8
- **Packing group**: III
- **Environmental hazards**: Yes
- **Special precautions for user**: Read safety instructions, SDS and emergency procedures before handling.

**IMDG**

- **UN number**: UN1760
- **UN proper shipping name**: Corrosive liquids, n.o.s. (Nonyl Phenol Mixture)
- **Transport hazard class(es)**
  - **Class**: 8
  - **Subsidiary risk**: -
  - **Label(s)**: 8
- **Packing group**: III
- **Environmental hazards**
  - **Marine pollutant**: Yes
  - **EmS**: Not available.
- **Special precautions for user**: Read safety instructions, SDS and emergency procedures before handling.
- **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**: Not established.
- **General information**: IMDG Regulated Marine Pollutant.

### 15. Regulatory information

**Canadian regulations**
This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

- **Controlled Drugs and Substances Act**: Not regulated.
- **Export Control List (CEPA 1999, Schedule 3)**: Not listed.
- **Greenhouse Gases**: Not listed.
- **Precursor Control Regulations**: Not regulated.

**International regulations**

- **Stockholm Convention**: Not applicable.
Rotterdam Convention
Not applicable.

Kyoto Protocol
Not applicable.

Montreal Protocol
Not applicable.

Basel Convention
Not applicable.

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>No</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>No</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>No</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>No</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Taiwan Chemical Substance Inventory (TCSI)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

Issue date: 17-September-2017
Revision date: 21-July-2019
Version No.: 02

List of abbreviations
LD50: Lethal Dose 50%.
LC50: Lethal Concentration 50%.
EC50: Effective Concentration, 50%.
NOAEC: No observed adverse effect concentration.
PEL: Permissible Exposure Limit.
STEL: Short-term Exposure Limit.
TWA: Time Weighted Average Value.

References
ACGIH
EPA: AQUIRE database
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
National Toxicology Program (NTP) Report on Carcinogens
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices

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