1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ECCOBOND™ 286 WHITE, PART B
Epoxy Adhesive (Hardener)

COMPANY ADDRESS
Henkel Electronic Materials LLC
14000 Jamboree Road
Irvine, CA  92606

EMERGENCY CONTACT NUMBERS:
MEDICAL:  1-877-671-4608 (toll free) or 1-303-592-1711
(24 hours - Poison Control Center)
TRANSPORT: CHEMTREC: 1-800-424-9300 (24 hours)
CHEMTREC International: 1-703-527-3887 (call collect)
Contact Information: 1-888-9-HENKEL (1-888-943-6535)
Internet: www.henkel.com/electronics

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER!
Possible cancer hazard.
CORROSIVE. CAUSES SEVERE OR PERMANENT DAMAGE TO EYES.
SEVERE SKIN IRRITANT. MAY CAUSE PERMANENT DAMAGE.
HARMFUL IF INHALED.
EYE IRRITANT.
HARMFUL IF SWALLOWED.
RESPIRATORY SENSITIZER.
SKIN SENSITIZER.
White Paste Amine Odor

EYE
Extremely severe irritant/corrosive. May cause severe burns which could lead to permanent damage or total loss of vision. The vapor and the liquid may cause burning, intense irritation and excessive watering of the eye.

SKIN CONTACT
Severely irritating; may cause permanent skin damage. Can be rapidly absorbed through skin. Repeated and/or prolonged contact may cause skin sensitization.

INHALATION
Vapor or aerosol, if generated, can cause irritation of the eyes, nose and respiratory tract. Possible respiratory sensitizer. Avoid breathing vapors or mists. Exposure to high concentrations may produce lung damage.

INGESTION
Severe irritation to mouth, throat, and stomach.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY Formulated Epoxy Resin

COMPONENT CAS NUMBER CONCENTRATION (% by weight)
4. FIRST-AID MEASURES

**EYE**
Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 15 minutes. Obtain immediate medical attention.

**SKIN CONTACT**
Immediately flush with large amounts of water; use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. Obtain immediate medical attention.

**INHALATION**
Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention.

**INGESTION**
If individual is conscious, give water to dilute stomach contents. Get prompt medical attention. DO NOT attempt to give anything by mouth to an unconscious person.

5. FIREFIGHTING MEASURES

**AUTOIGNITION**
Not available

**FLASH POINT**
> 200 °F

**EXTINGUISHING MEDIA**
CO2; Dry Chemical; Water Spray

**SPECIAL FIREFIGHTING PROCEDURES**
Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.

**FIRE & EXPLOSION HAZARDS**
A self-contained breathing apparatus and suitable protective clothing should be worn in fire conditions.

**HAZARDOUS COMBUSTION PRODUCTS**
Carbon dioxide, carbon monoxide, oxides of nitrogen and unknown organics.

**LOWER EXPLOSION LIMIT (%)**
Not applicable

**UPPER EXPLOSION LIMIT (%)**
Not applicable

6. ACCIDENTAL RELEASE MEASURES

**SPILL AND LEAK PROCEDURES**
Absorb spillages onto sand, earth or any suitable absorbent material. Sweep up and shovel into waste drums. Wash the spillage area with water.

For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

**STORAGE TEMPERATURE**
25 °C

**SHELF LIFE, (Days)**
365

**HANDLING/STORAGE**
Store in cool, dry place. Keep in a well ventilated place.

**SENSITIVITY TO STATIC ELECTRICITY**
No

**SPECIAL SENSITIVITY**
Keep away from heat.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>EXPOSURE LIMITS</th>
<th>OSHA</th>
<th>Mfg Working Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>10 mg/m3 PEL (total dust); 5 mg/m3 PEL (respirable)</td>
<td>15 mmpcf TWA</td>
<td>Manufacturer: 6 mg/m3</td>
</tr>
</tbody>
</table>
fraction, listed under Particulates not otherwise regulated).

Silicon dioxide, crystalline free
10 mg/m³ PEL (total dust); 5 mg/m³ PEL (respirable fraction, listed under Particulates not otherwise regulated).

Titanium dioxide
10 mg/m³ TWA.

VENTILATION REQUIREMENTS
Local exhaust.

EYE PROTECTION REQUIREMENTS
Wear safety glasses with side shields.

GLOVE REQUIREMENTS
The use of chemically resistant gloves is recommended.

CLOTHING REQUIREMENTS
Employee must wear appropriate protective clothing and equipment to prevent any possibility of skin contact with this substance.

CHANGE/REMOVAL OF CLOTHING
Remove contaminated clothing and launder before reuse.

WASH REQUIREMENTS
Wash before eating, drinking, or using toilet facilities.

RESPIRATOR REQUIREMENTS
Local exhaust.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PURE SUBSTANCE OR MIXTURE</td>
<td>Mixture</td>
</tr>
<tr>
<td>PHYSICAL FORM</td>
<td>Paste</td>
</tr>
<tr>
<td>COLOR</td>
<td>White</td>
</tr>
<tr>
<td>ODOR</td>
<td>Amine</td>
</tr>
<tr>
<td>ODOR THRESHOLD</td>
<td>Not available</td>
</tr>
<tr>
<td>OXIDIZING PROPERTIES</td>
<td>Not applicable</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Soluble</td>
</tr>
<tr>
<td>PARTITION COEFFICIENT (n-octanol/water)</td>
<td>Not determined</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (WATER=1)</td>
<td>2.000</td>
</tr>
<tr>
<td>EVAPORATION RATE</td>
<td>Not applicable</td>
</tr>
<tr>
<td>VAPOR PRESSURE (mmHg)</td>
<td>Negligible @ 25°C</td>
</tr>
<tr>
<td>VAPOR DENSITY (air = 1)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>VOLATILES</td>
<td>Negligible</td>
</tr>
<tr>
<td>VOLATILE ORGANIC COMPOUNDS</td>
<td>Negligible</td>
</tr>
<tr>
<td>AUTOIGNITION</td>
<td>Not available</td>
</tr>
<tr>
<td>FLASH POINT</td>
<td>&gt; 200 °F</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>STABILITY</td>
<td>Stable</td>
</tr>
<tr>
<td>STABILITY DETAIL</td>
<td>Material is stable under normal temperatures and pressures.</td>
</tr>
<tr>
<td>MATERIALS TO AVOID</td>
<td>Strong oxidizers, Strong Lewis acids, Mineral acids</td>
</tr>
<tr>
<td>CONDITIONS TO AVOID</td>
<td>Elevated temperatures</td>
</tr>
<tr>
<td>HAZARDOUS DECOMPOSITION PRODUCTS</td>
<td>Carbon dioxide, carbon monoxide, oxides of nitrogen and unknown organics. Aldehydes</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROUTE OF ENTRY</td>
<td>Skin Contact; Eye Contact; Ingestion</td>
</tr>
</tbody>
</table>
CARCINOGEN

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>IARC (group)</th>
<th>NTP</th>
<th>OSHA Substance Specific Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium dioxide</td>
<td>Yes (2B)</td>
<td>No</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

CHRONIC (LONG TERM) EFFECTS OF EXPOSURE

TARGET ORGANS

Eyes; Skin; Respiratory system

RESPIRATORY SENSITIZATION

Sensitizer. May cause allergic reaction.

SKIN SENSITIZATION

Sensitizer. May cause allergic reaction.

PRODUCT TOXICOLOGY

PRODUCT INFORMATION

This health hazard assessment is based on a consideration of the composition of this product.

COMPONENT ORAL TOXICITY

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>ORAL TOXICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>No hazard in normal industrial use. Ingestion may cause irritation of the gastrointestinal tract. Non-toxic.</td>
</tr>
<tr>
<td>3,3(^{-})Oxybis(ethyleneoxy)bis(propylamine)</td>
<td>Oral LD50: Rat 3160 mg/kg Corrosive to mouth, throat and stomach.</td>
</tr>
<tr>
<td>Epoxy resin</td>
<td>Oral LD50: Rat &gt; 5000 mg/kg Unlikely to be hazardous if swallowed.</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>Oral LD50: Rat &gt; 10000 mg/kg Unlikely to be hazardous if swallowed.</td>
</tr>
</tbody>
</table>

COMPONENT DERMAL TOXICITY

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>DERMAL TOXICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>Slight/mild irritant.</td>
</tr>
<tr>
<td>3,3(^{-})Oxybis(ethyleneoxy)bis(propylamine)</td>
<td>Dermal LD50: Rabbit 2500 mg/kg Corrosive.</td>
</tr>
<tr>
<td>Epoxy resin</td>
<td>Dermal LD50: Rabbit &gt; 6000 mg/kg Repeated or prolonged skin contact may result in moderate irritation. Repeated and/or prolonged contact may cause skin sensitization.</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>Dermal LD50: Rabbit &gt; 10000 mg/kg May cause mechanical irritation.</td>
</tr>
</tbody>
</table>

COMPONENT INHALATION TOXICITY

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>INHALATION TOXICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>Dust may cause irritation.</td>
</tr>
<tr>
<td>3,3(^{-})Oxybis(ethyleneoxy)bis(propylamine)</td>
<td>Inhalation of dust or vapor may cause severe irritation to the nasal passages and/or the respiratory system.</td>
</tr>
<tr>
<td>Epoxy resin</td>
<td>Unlikely to be hazardous by inhalation because of the low vapor pressure of the material at ambient temperature.</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>Inhalation LC50 (4hr): Rat 6.8 mg/l Exposure to high concentrations may produce lung damage.</td>
</tr>
</tbody>
</table>
COMPONENT
Aluminum oxide

3,3’-Oxybis(ethyleneoxy)bis(propylamine)

Epoxy resin

Titanium dioxide

NOTES ON EYE IRRITATION
Slight/mild irritant. Particulates may scratch eye surfaces and cause mechanical irritation.

Extremely severe irritant/corrosive. May cause severe burns which could lead to permanent damage or total loss of vision.

May cause eye irritation.

Particulates may scratch eye surfaces and cause mechanical irritation.

12. ECOLOGICAL INFORMATION

POTENTIAL TO BIOACCUMULATE
Unknown.

AQUATIC TOXICITY
None Established

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS
Disposal should be in accordance with local, state or national legislation.

EMPTY CONTAINER WARNINGS
Empty containers may contain product residue; follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

This section provided for general information only. The shipping description below may not represent requirements for all modes of transportation, packaging, shipping methods or locations outside of the United States.

FOR MORE COMPLETE TRANSPORTATION REGULATORY INFORMATION PLEASE REFER TO THE SHIPPING DOCUMENTS ACCOMPANYING THE SHIPMENT OF THIS PRODUCT.

DOT CLASSIFICATION
Not Regulated

The information provided herein may not include the impact of additional regulatory requirements (eg. for materials meeting the definition of a hazardous waste under RCRA, hazardous substances under CERCLA, and/or marine pollutants under CWA or other similar federal, state or local laws) or any associated exceptions or exemptions under regulations applicable to the transport of this material.

15. REGULATORY INFORMATION

TSCA
All components are on the TSCA inventory.

Canadian Domestic Substance List (DSL)
Is on DSL

China (IECSC)
On the IECSC Inventory.

Philippines (PICCS)
On the PICCS Inventory.

EINECS
All components of this product are listed in EINECS or ELINCS, or are otherwise exempt from EU notification requirements.

SARA - Section 313 (Superfund Amendments and Reauthorization Act of 1986 - 40CFR 372)
CAS NUMBER

PAGE 5 OF 6
### CALIFORNIA PROPOSITION 65
WARNING: This product contains the following chemicals that are known to the State of California to cause cancer, birth defects or other reproductive harm.
Unless a concentration is specified in Section 2 of the MSDS, the below chemical/s are present in trace amounts.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenyl glycidyl ether</td>
<td>122-60-1</td>
</tr>
<tr>
<td>Epichlorohydrin</td>
<td>106-89-8</td>
</tr>
</tbody>
</table>

### 16. OTHER INFORMATION

**HMIS® Hazard Ratings**

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs by OSHA's 29 CFR 1910.1200, we choose to provide them as a service to our customers using HMIS®. These ratings are to be used only with a fully implemented HMIS® program. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

NPCA recommends that employers must determine appropriate PPE for the actual conditions under which this product is used in their workplace. For information on PPE codes, consult the HMIS® Implementation Manual.

When two ratings are provided for Health, the first represents the material 'as supplied', and the second represents the material 'in use'.

* = chronic health hazard

**HMIS® is a registered trademark of the National Paint and Coatings Association (NPCA).**

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>*3</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**RECOMMENDED USE**
Adhesive

**PREPARED BY:**
Regulatory Affairs
Henkel Electronic Materials

The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation and its affiliates (“Henkel”) does not assume responsibility for any results obtained by persons over whose methods Henkel has no control. It is the user’s responsibility to determine the suitability of Henkel’s products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any Henkel’s products. In light of the foregoing, Henkel specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel’s products. Henkel further disclaims any liability for consequential or incidental damages of any kind, including lost profits.