MATERIAL SAFETY DATA SHEET

ADDOCAT PP 374D

RHEIN CHEMIE CORPORATION
1014 Whitehead Road Ext.
Trenton, NJ 08638

TRANSPORTATION EMERGENCY
CALL CHEMTREC........ : (800) 424-9300
INTERNATIONAL ........... : (703) 527-3887

NON-TRANSPORTATION
RCC EMERGENCY PHONE : (609) 771-9100
RCC INFORMATION PHONE: (800) 289-2436

Section 1: Product and Company Identification

Product Name: ADDOCAT PP 374D
Article Number: 2284463
Chemical Family: Tertiary Aliphatic Amine Blend
Chemical Name: bis(2-dimethylaminoethyl)(methyl) amine
Synonyms: Pentamethyldiethylene triamine

Section 2: Composition/Information on Ingredients

HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient Name/ CAS Number</th>
<th>Exposure Limits</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-[2-(Dimethylamino)ethyl]-4-methylpiperazine 104-19-8</td>
<td>OSHA (PEL): Not Established</td>
<td>60% 100%</td>
</tr>
<tr>
<td>Pentamethyldiethylenetriamine 3030-47-5</td>
<td>OSHA (PEL): Not Established</td>
<td>15% 40%</td>
</tr>
</tbody>
</table>

Section 3: Hazards Identification

EMERGENCY OVERVIEW

DANGER! Corrosive. Toxic. Color: Colorless to Yellow Form: Liquid Odor: Pungent odor (Amine like)
May cause eye, skin, and respiratory tract burns. Harmful if inhaled or ingested. Causes respiratory tract irritation. Causes skin irritation. May be fatal if absorbed through skin. Skin sensitizer. Causes eye irritation. May cause a temporary fogging of the eyes. Harmful if swallowed. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Ground containers and equipment before transferring to avoid static sparks. Water may cause frothing. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Toxic gases/fumes are given off during burning or thermal decomposition. Closed container may explode under extreme heat.

POTENTIAL HEALTH EFFECTS

Route(s) of Entry: Inhalation, Skin Contact, Eye Contact

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation Hazards
Acute Inhalation Hazards: This product may cause irritation of the respiratory tract and mucous membranes of the nose and throat. Inhalation of the vapors results in coughing, choking and possible burns of the mucous membranes. In some cases, pulmonary edema may develop, either immediately or more often within a period of 5-72 hours.

Chronic Inhalation Hazards: Depending on the concentration and duration of exposure, repeated and/or prolonged exposure may cause inflammatory and ulcerative changes in the mouth and possibly bronchial and gastrointestinal disturbances.

Skin Hazards
Acute Skin Hazards: Direct contact may cause severe irritation, pain or local discomfort. Contact may lead to burns associated with severe reddening and swelling of the affected area. May cause sensitization by skin contact. May be absorbed through the skin in toxic (fatal) amounts.

Chronic Skin Hazards: Repeated and/or prolonged contact with this product may cause dermatitis or other allergic skin reactions. May be absorbed thorough the skin in toxic (fatal) amounts.

Eye Hazards
Acute Eye Hazards: Exposure to vapor or solution causes severe irritation and possible burns. The amine vapors are irritating and have been reported to cause transient fogging of the eyes or corneal edema. Initial symptoms may be discomfort, tearing and/or blurring of vision, "halo-vision". Permanent eye damage including blindness may result if there is a delay in flushing product from the person's eyes.

Chronic Eye Hazards: Effects are expected to be similar to those listed above for acute eye exposure. In addition to effects listed in acute exposure, repeated or prolonged contact may result in conjunctivitis.

Ingestion Hazards
Acute Ingestion Hazards: This product if ingested will cause severe gastrointestinal distress. May cause pain and severe burns of the mucous membranes of the nose, mouth, throat and esophagus. There may be discoloration of the tissues. Swallowing and speech may be difficult at first and then almost impossible. The effects on the esophagus and gastrointestinal tract may range from irritation to severe corrosion.
**Chronic Ingestion Hazards:** None reported for this product as a whole, expected to be similar to those listed for acute ingestion.

**Carcinogenic Components:**

<table>
<thead>
<tr>
<th>Source</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTP</td>
<td>None</td>
</tr>
<tr>
<td>IARC</td>
<td>None</td>
</tr>
<tr>
<td>OSHA</td>
<td>None</td>
</tr>
</tbody>
</table>

**Medical Conditions Aggravated by Exposure:** May aggravate existing skin disorders.

### Section 4: First Aid Measures

**First Aid for Eye:** Call a physician immediately. In case of contact, flush eyes with large quantities of water for at least 15 minutes. The eyelids should be held apart during irrigation to ensure thorough flushing of all eye tissue.

**First Aid for Skin:** In case of skin contact, wash affected areas with soap and water. Call a physician immediately. Immediately remove contaminated clothing and shoes.

**First Aid for Inhalation:** If breathing is difficult, give oxygen. Call a physician immediately. If not breathing, give artificial respiration. If inhaled, remove to fresh air.

**First Aid for Ingestion:** Give victim one or two glasses of water or milk. If material is ingested, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

**Note to Physician:** For inhalation, consider oxygen. Inducing vomiting is contraindicated because of the irritating nature of the product.

### Section 5: Fire Fighting Measures

**Flash Point:** 181 °F (83 °C) DIN 51758

**Flammable Limits:**

<table>
<thead>
<tr>
<th>Limit</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Explosion Limit</td>
<td>Not Established</td>
</tr>
<tr>
<td>Lower Explosion Limit</td>
<td>Not Established</td>
</tr>
</tbody>
</table>

**Auto-ignition Temperature:** 321 °F (175 °C) DIN 51794

**Extinguishing Media:** Water, Carbon Dioxide, Dry Chemical, Foam

**Special Fire Fighting** Full emergency equipment with self-contained breathing apparatus
Procedures: and full protective clothing should be worn by firefighters. Use cold water spray to cool fire exposed containers. Material supports combustion. During a fire, irritating and toxic gases may be generated by thermal decomposition or combustion.

Section 6: Accidental Release Measures

Spill or Leak Procedures: Extinguish all ignition sources. Emergency clean-up personnel should wear appropriate protection when entering the spill area for clean-up. Do not allow spilled or released material to enter ground water, waste water or soil. Notify local health authorities and other appropriate agencies if such contamination should occur. Place in properly marked containers for disposal. Vermiculite absorbent can be spread over the spill area to absorb as much of the remaining product as possible. Scoop up solid absorbent for waste disposal. Spill area can be washed with water. Ventilate area to remove vapors.

Other Accidental Release Notes: Rhein Chemie requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Such notification must be immediate and made by the person having knowledge of the release. Distribution includes transportation, storage incidental to transportation, loading and unloading.

Section 7: Handling and Storage

Storage Temperature:
- Minimum: 57 °F (14 °C)
- Maximum: 77 °F (25 °C)

Special Sensitivity: Moisture.

Handling/Storage Precautions: Handle in accordance with good industrial hygiene and safety practices. Keep away from heat, sparks and flames. Keep container tightly closed when not in use. Avoid contact with skin or clothing. Avoid breathing dusts, vapors or mists. Do not reseal container if contamination is suspected.

Section 8: Exposure Controls/Personal Protection

Personal Protection Equipment

Eye Protection Requirements: Contact lenses should not be worn., Chemical safety goggles, full-face shield., Safety glasses with side shields or goggles are recommended.

Skin Protection Requirements: Permeation resistant gloves (neoprene, nitrile, or PVC) and impervious clothing (long sleeve shirts) are recommended., Barrier
creams may be used but their use should be kept to a minimum.

**Ventilation Requirements:** Use local exhaust ventilation if dusting or misting is a problem, to maintain air levels below the recommended exposure limit.

**Respirator Requirements:** The specific respirator selected must be based on contamination levels found in the workplace, must not exceed the working limits of the respirator and be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA). Air purifying respirator equipped with a full-face organic vapor and dust/mist cartridge if vapors are near or exceeding the exposure limits listed in Section 2. In areas of high concentrations, confined space or other poorly ventilated areas and for large spill clean-up sites, fresh air-line respirators or self-contained breathing apparatus should be used. Observe OSHA regulations for respirator use (29 CFR 1910.134.)

**Additional Protective Measures:** Safety showers and eyewash stations should be accessible to the work area. Employees working with this product should not eat, drink, or use tobacco products in the work area.

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### Section 9: Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Form:</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Color:</strong></td>
<td>Colorless to Yellow</td>
</tr>
<tr>
<td><strong>Odor:</strong></td>
<td>Pungent odor (Amine like)</td>
</tr>
<tr>
<td><strong>Odor Threshold:</strong></td>
<td>Not Established</td>
</tr>
<tr>
<td><strong>Molecular Weight:</strong></td>
<td>173</td>
</tr>
<tr>
<td><strong>pH:</strong></td>
<td>Approximately 11.6 @ 100 g/l 68 °F (20 °C)</td>
</tr>
<tr>
<td><strong>Boiling Point:</strong></td>
<td>410 °F (210 °C) @ 759.8 mmHg</td>
</tr>
<tr>
<td><strong>Melting/Freezing Point:</strong></td>
<td>Not Established</td>
</tr>
<tr>
<td><strong>Viscosity:</strong></td>
<td>1.52 mPa.s @ 68 °F (20 °C)</td>
</tr>
<tr>
<td><strong>Solubility in Water:</strong></td>
<td>Miscible</td>
</tr>
<tr>
<td><strong>Specific Gravity:</strong></td>
<td>0.87 @ 68 °F (20 °C) DIN 51757</td>
</tr>
<tr>
<td><strong>Bulk Density:</strong></td>
<td>Not Established</td>
</tr>
<tr>
<td><strong>Percent Volatile by Volume:</strong></td>
<td>None detected.</td>
</tr>
<tr>
<td><strong>Vapor Pressure:</strong></td>
<td>0.225 mmHg @ 68 °F (20 °C)</td>
</tr>
<tr>
<td><strong>Vapor Density:</strong></td>
<td>Not Established</td>
</tr>
</tbody>
</table>

### Section 10: Stability and Reactivity

**Stability:** Stable

**Hazardous Polymerization:** Will not occur

**Substances to Avoid:** Oxidizing materials, isocyanates (exothermic reaction), acids, chlorinated organics, and aldehydes., Do not allow product to contact copper or copper-containing metals., Nitrosating agents.

**Conditions to Avoid:** Periods of prolonged overheating or temperatures above 86 F (30 C) will cause discoloration.

**Decomposition Products:** By heat or fire: oxides of carbon, oxides of nitrogen, and other
aliphatic fragments which have not been determined.

Section 11: Toxicological Information

Toxicity Data for ADDOCAT PP 374D
Toxicity Note: No data available for this product.

Toxicity Data for 1-[2-(Dimethylamino)ethyl]-4-methylpiperazine
Acute oral toxicity: LD$_{50}$ = 1,420 uL/kg (Rat)
Acute dermal toxicity: LD$_{50}$ = 390 uL/kg (Rabbit)
Eye Irritation: Severely irritating 24 hrs, (Rabbit) Standard Draize Test
Skin Irritation: Severely irritating 24 hrs, (Rabbit) Standard Draize Test

Toxicity Data for Pentamethyldiethylenetriamine
Acute oral toxicity: LD$_{50}$ = 1,330 mg/kg (Rat)
Acute dermal toxicity: LD$_{50}$ = 230 mg/kg (Rabbit)
Eye Irritation: Severely irritating (Rabbit)
Skin Irritation: Corrosive (Rabbit)

Section 12: Ecological Information

Ecological Data for ADDOCAT PP 374D
Ecological Note: No data available for this product.

Ecological Data for 1-[2-(Dimethylamino)ethyl]-4-methylpiperazine
Ecological Note: No data available for this component.

Ecological Data for Pentamethyldiethylenetriamine
Fish Toxicity: 220 mg/L, 96 hrs. Ide, silver or golden orfe (Leuciscus idus)
Biodegradation: < 20 %,

Section 13: Disposal Considerations

Waste Disposal Method: Disposal must be in compliance with federal, state and local environmental control regulations. If incinerated, toxic and corrosive combustion gases must be properly handled.

Empty Container Precautions: Empty container retains product residue and can be hazardous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat, flame, sparks, static electricity, or other sources of ignition. Recondition or dispose of empty container in accordance with government regulations.
Section 14: Transportation Information

Technical shipping name: Pentamethyldiethylene Triamine

Freight Class
   Bulk: Chemicals, N.O.I. (NMFC 60000)
   Package: Chemicals, N.O.I. (NMFC 60000)

Product Label: Product Label Established

Domestic Surface Transportation (DOT)
Proper Shipping Name: Corrosive Liquids, Toxic, N.O.S.
Hazard Class or Division: 8, 6.1
UN/NA Number: UN2922
Packing Group: II
Hazard Label(s): Corrosive, Toxic
Hazard Placard(s): Corrosive, Toxic

Marine Transportation (IMO / IMDG)
Proper Shipping Name: Corrosive Liquid, Toxic, N.O.S.
Hazard Class Division Number: 8, 6.1
UN Number: UN2922
Packaging Group: II
Hazard Label(s): Corrosive, Toxic
Hazard Placard(s): Corrosive, Toxic

Air Transportation (ICAO / IATA)
Proper Shipping Name: Corrosive Liquid, Toxic, N.O.S.
Hazard Class Division Number: 8
UN Number: UN2922
Subsidiary Risk: 6.1
Packaging Group: II
Hazard Label(s): Corrosive, Toxic
Radioactive?: Non-Radioactive
Passenger Air - Max. Qty.: 1 L
Passenger Packing Instruction: 808
Cargo Air - Max. Qty.: 30 L
Cargo Air Packing Instruction: 812

Section 15: Regulatory Information

United States Federal Regulations
OSHA Hazcom Standard Rating: Hazardous
TSCA Inventory List: On TSCA Inventory

CERCLA Hazardous Substance:
Component(s) Reportable Quantity
None

SARA Title III
SARA Section 302 Extremely Hazardous Substances:
Component(s)/ CAS Number Concentration
None

SARA Section 311/312 Hazard Categories:
Immediate Health Hazard, Delayed Health Hazard

SARA Section 313 Toxic Chemicals:
Component(s)/ Reporting CAS Number Concentration Threshold Min. Max.
None

RCRA Status: When discarded in its purchased form, this product meets the criteria of corrosivity, and should be managed as a hazardous waste (EPA Hazardous Waste Number D002). (40 CFR 261.20-24)

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

**State Right-to-Know Information**

<table>
<thead>
<tr>
<th>Component(s)/ CAS Number</th>
<th>State Code</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-[2-(Dimethylamino)ethyl]-4-methylpiperazine 104-19-8</td>
<td>PA-N, NJ-N</td>
<td>60% 100%</td>
</tr>
<tr>
<td>Pentamethyldiethylenetriamine 3030-47-5</td>
<td>PA-N, NJ-N</td>
<td>15% 40%</td>
</tr>
</tbody>
</table>

**State Code Translation Table**

PA-N = Pennsylvania Non-hazardous
NJ-N = New Jersey Other - includes predominant ingredients

**Foreign Chemical Inventory List(s)**

<table>
<thead>
<tr>
<th>EINECS (Europe):</th>
<th>Listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSL (Canada):</td>
<td>Listed</td>
</tr>
<tr>
<td>AICS (Australia):</td>
<td>Listed</td>
</tr>
<tr>
<td>MITI (Japan):</td>
<td>Listed</td>
</tr>
<tr>
<td>MOE (Korea):</td>
<td>Listed</td>
</tr>
<tr>
<td>PICCS (Philippines):</td>
<td>Listed</td>
</tr>
</tbody>
</table>

**Section 16: Other Information**

**HMIS Rating**

| Health | 3 |

Material Name: ADDOCAT PP 374D Article Number: 2284463
<table>
<thead>
<tr>
<th>Flammability</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</td>
<td>0</td>
</tr>
</tbody>
</table>

0=Minimal  1=Slight  2=Moderate  3=Serious  4=Severe
*=Chronic Health Hazard

RHEIN CHEMIE CORPORATION’s method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by RHEIN CHEMIE CORPORATION as a customer service.

Contact: HES Dept.
Phone: (609) 771-3522
MSDS Number: 000000002322
Version Date: 01/17/2006
MSDS Version: 3.0

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