Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

**Common Name/Trade Name**
Phosphorus pentoxide

**Manufacturer**
SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

**Commercial Name(s)**
Not available.

**Synonym**
Diphosphorus pentoxide; Phosphorus (V) Oxide

**Chemical Name**
Phosphorus Oxide

**Chemical Family**
Not available.

**Chemical Formula**
P2O5

**Supplier**
SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

**Catalog Number(s).**
YY859, P1125

**CAS#**
1314-56-3

**RTCS**
TH3945000

**TSCA**
TSCA 8(b) inventory:
Phosphorus pentoxide

**CI#**
Not available.

**In Case of Emergency**
CHEMIREC (24hr) 800-424-9300

**CALL**
(310) 516-8000

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>TWA (mg/m³)</th>
<th>STEL (mg/m³)</th>
<th>CEIL (mg/m³)</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Phosphorus pentoxide</td>
<td>1314-56-3</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

**Toxicological Data on Ingredients**
Phosphorus pentoxide:
DUST (LC50): Acute: 1217 mg/m³ 1 hours [Rat]. 271 mg/m³ 1 hours [Mouse]. 1689 ml/m³ 1 hours [Rabbit].

Section 3. Hazards Identification

**Potential Acute Health Effects**
Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion. Hazardous in case of skin contact (corrosive), of eye contact (corrosive), of inhalation. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Continued on Next Page
### Potential Chronic Health Effects

- **CARCINOGENIC EFFECTS:** Not available.
- **MUTAGENIC EFFECTS:** Not available.
- **TERATOGENIC EFFECTS:** Not available.
- **DEVELOPMENTAL TOXICITY:** Not available.

The substance may be toxic to the upper respiratory tract, skin, eye, lens, or cornea. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

### Section 4. First Aid Measures

#### Eye Contact
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

#### Skin Contact
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

#### Serious Skin Contact
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

#### Inhalation
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

#### Serious Inhalation
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

#### Ingestion
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

#### Serious Ingestion
Not available.

### Section 5. Fire and Explosion Data

#### Flammability of the Product
Non-flammable. However, it can cause high local temperatures in contact with water; heat generated may enough to ignite other materials.

#### Auto-Ignition Temperature
Not applicable.

#### Flash Points
Not applicable.

#### Flammable Limits
Not applicable.

#### Products of Combustion
Not available.

#### Fire Hazards in Presence of Various Substances
- **of moisture**
- Risk of explosion of the product in presence of mechanical impact: Not available.
- Risk of explosion of the product in presence of static discharge: Not available.

#### Explosion Hazards in Presence of Various Substances
This material is non-combustible. Use agent most appropriate to extinguish surrounding fire (Dry chemical or CO2). Do not use water.

#### Fire Fighting Media and Instructions
Addition of Phosphorus Pentoxide to Propargyl Alcohol caused the alcohol to burst into flame. It reacts violently with water to form Phosphoric acid. Phosphoric acid in contact with common metals may generate flammable and explosive Hydrogen gas.

#### Special Remarks on Fire Hazards
A violent explosion occurs if a solution of Perchloric acid in Chloroform is poured on Phosphorus Pentoxide.
### Section 6. Accidental Release Measures

**Small Spill**
Cover with completely DRY earth, DRY sand, or other non-combustible material followed by a plastic sheet to minimize spreading or contact with rain. Use clean appropriate tools to put the spilled solid in a convenient and appropriate waste disposal container.

**Large Spill**
Corrosive solid.
Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dilute if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

### Section 7. Handling and Storage

**Precautions**
Keep container dry. Do not ingest. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as moisture.

**Storage**
Keep container tightly closed. Keep container in a cool, well-ventilated area.

### Section 8. Exposure Controls/Personal Protection

**Engineering Controls**
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection**
- Splash goggles.
- Synthetic apron.
- Vapor and dust respirator.
- Be sure to use an approved/certified respirator or equivalent.
- Gloves.

**Personal Protection in Case of a Large Spill**
- Splash goggles.
- Full suit.
- Vapor and dust respirator.
- Boots.
- Gloves.
- A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits**
- STEL: 2 (mg/m³) [United Kingdom (UK)]
- Consult local authorities for acceptable exposure limits.

### Section 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical state and appearance</strong></td>
<td>Solid. (Deliquescent solid. Crystalline powder.)</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>141.94 g/mole</td>
</tr>
<tr>
<td>pH (1% soln/water)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Melting Point</td>
<td>340°C (644°F) Sublimation Temperature: 360°C.</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>2.3 - 2.39 (Water = 1)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>4.9 (Air = 1)</td>
</tr>
<tr>
<td>Volatility</td>
<td>Not available.</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available.</td>
</tr>
<tr>
<td>Water/Oil Dist. Coeff.</td>
<td>Not available.</td>
</tr>
<tr>
<td>Ionicity (in Water)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Dispersion Properties</td>
<td>Not available.</td>
</tr>
<tr>
<td>Solubility</td>
<td>Insoluble in acetone. Soluble in sulfuric acid.</td>
</tr>
</tbody>
</table>

*Continued on Next Page*
### Section 10. Stability and Reactivity Data

<table>
<thead>
<tr>
<th>Stability</th>
<th>The product is stable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Conditions of Instability</td>
<td>Water, incompatible materials</td>
</tr>
<tr>
<td>Incompatibility with various substances</td>
<td>Reactive with moisture.</td>
</tr>
<tr>
<td>Corrosivity</td>
<td>Non-corrosive in presence of glass.</td>
</tr>
</tbody>
</table>

**Special Remarks on Reactivity**

- Reacts violently with water to evolve heat and to form phosphoric acid.
- Calcium Oxide or Sodium Hydroxide reacts with Phosphorus Pentoxide extremely violently when initiated by local heating.
- Chlorine Trifluoride produces a violent reaction in presence of Phosphorus Pentoxide.
- Incompatible with Propargyl alcohol, Sodium Carbonate, Perchloric acid + Chloriform.
- Addition of Phosphorus Pentoxide to Propargyl Alcohol caused the alcohol to burst into flame.
- It reacts violently with water to form Phosphoric acid. Phosphoric acid in contact with common metals may generate flammable and explosive Hydrogen gas.

**Special Remarks on Corrosivity**

Not available.

**Polymerization**

Will not occur.

### Section 11. Toxicological Information

**Routes of Entry**

- Absorbed through skin. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals**

**WARNING:** THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.

Acute toxicity of the dust (LC50): 271 mg/m³ 1 hours [Mouse].

**Chronic Effects on Humans**

May cause damage to the following organs: upper respiratory tract, skin, eye, lens or cornea.

**Other Toxic Effects on Humans**

Extremely hazardous in case of inhalation (lung corrosive).

Very hazardous in case of skin contact (irritant), of ingestion.

Hazardous in case of skin contact (corrosive), of eye contact (corrosive).

**Special Remarks on Toxicity to Animals**

Not available.

**Special Remarks on Chronic Effects on Humans**

Not available.

**Special Remarks on other Toxic Effects on Humans**

Acute Potential Health Effects:

- Skin: Corrosive. Causes severe irritation and burns.
- Eyes: Corrosive. Causes severe irritation, conjunctivitis, and burns. Can cause permanent blue-white opacities on the cornea when particles of solid phosphorus pentoxide come into contact with the eyes. Photophobia may occur as a result of contact to the eyes.
- Inhalation: Causes respiratory tract irritation, and inflammation with coughing, labored breathing. Severe chemical pneumonitis and pulmonary edema could develop.
- Ingestion: Corrosive. Causes digestive/gastrointestinal tract burns, nausea, vomiting, abdominal pain. Brown or yellow stains will be found in the mouth. Watery diarrhea with occult blood may develop. May cause metabolic acidosis, hyperphosphatemia, hypocalcemia, mild hypothermia, low blood pressure, cardiovascular arrhythmias, shock. It may also affect the liver (jaundice, LDH elevation), urinary system (hematuria), blood, bone marrow. Aspiration into the lungs can cause chemical pneumonitis.

Chronic Potential Health Effects

- Ingestion: Prolonged or repeated ingestion may cause liver and kidney damage, blood disorders, jaw and tooth abnormalities, and cardiovascular effects, and may induce phosphorus poisoning.

Continued on Next Page
### Section 12. Ecological Information

<table>
<thead>
<tr>
<th>Ecotoxicity</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD5 and COD</td>
<td>Not available.</td>
</tr>
<tr>
<td>Products of Biodegradation</td>
<td>Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.</td>
</tr>
<tr>
<td>Toxicity of the Products of Biodegradation</td>
<td>The products of degradation are less toxic than the product itself.</td>
</tr>
<tr>
<td>Special Remarks on the Products of Biodegradation</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

### Section 13. Disposal Considerations

| Waste Disposal | Waste must be disposed of in accordance with federal, state and local environmental control regulations. |

### Section 14. Transport Information

<table>
<thead>
<tr>
<th>DOT Classification</th>
<th>Class 8: Corrosive material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification</td>
<td>UNNA: 1807 : Phosphorous pentoxide  PG: II</td>
</tr>
<tr>
<td>Special Provisions for Transport</td>
<td>Not available.</td>
</tr>
<tr>
<td>DOT(Pictograms)</td>
<td><img src="image" alt="DOT Classification" /></td>
</tr>
</tbody>
</table>

### Section 15. Other Regulatory Information and Pictograms

<table>
<thead>
<tr>
<th>Federal and State Regulations</th>
<th>Connecticut hazardous material survey: Phosphorus pentoxide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New York release reporting list: Phosphorus pentoxide</td>
</tr>
<tr>
<td></td>
<td>Pennsylvania RTK: Phosphorus pentoxide</td>
</tr>
<tr>
<td></td>
<td>Massachusetts RTK: Phosphorus pentoxide</td>
</tr>
<tr>
<td></td>
<td>Massachusetts spill list: Phosphorus pentoxide</td>
</tr>
<tr>
<td></td>
<td>New Jersey: Phosphorus pentoxide</td>
</tr>
<tr>
<td></td>
<td>New Jersey spill list: Phosphorus pentoxide</td>
</tr>
<tr>
<td></td>
<td>TSCA (b) inventory: Phosphorus pentoxide</td>
</tr>
<tr>
<td>California Proposition 65 Warnings</td>
<td>California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.</td>
</tr>
<tr>
<td></td>
<td>California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.</td>
</tr>
<tr>
<td>Other Classifications</td>
<td>WHMIS (Canada) CLASS E: Corrosive solid.</td>
</tr>
</tbody>
</table>

**Continued on Next Page**
Phosphorus pentoxide

R35- Causes severe burns

S22- Do not breathe dust.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

<table>
<thead>
<tr>
<th>HMIS (U.S.A.)</th>
<th>National Fire Protection Association (U.S.A.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Hazard</td>
<td>3 Security Level</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>0 Security Level</td>
</tr>
<tr>
<td>Reactivity</td>
<td>2 Security Level</td>
</tr>
<tr>
<td>Personal Protection</td>
<td>j</td>
</tr>
</tbody>
</table>

WHMIS (Canada) (Pictograms)

DSCL (Europe) (Pictograms)

TDG (Canada) (Pictograms)

ADR (Europe) (Pictograms)

Protective Equipment

- Gloves.
- Synthetic apron.
- Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
- Splash goggles.

Continued on Next Page
**Section 16. Other Information**

<table>
<thead>
<tr>
<th>MSDS Code</th>
<th>P3750</th>
</tr>
</thead>
<tbody>
<tr>
<td>References</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

**Other Special Considerations**

| Major Uses | In the preparation of phosphorus oxychloride and metaphosphoric acid; in surfactants; in sugar refining; as a laboratory reagent; in fire extinguishing media; in special glasses; in the synthesis of phosphate esters subsequently used as flame retardants, solvents, diluents; as drying an dehydrating agent for liquids and gases with which it does not react, especially for removing traces of water from vacuum systems; as a condensing agent in organic synthesis. |

Validated by Sonia Owen on 9/18/2008.  
Verified by Sonia Owen.  
Printed 9/22/2008.

**Notice to Reader**

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data, it is unreliable. Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.