SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

SDS Number: M631  Effective Date: May 6, 2014  Supersedes: March 3, 2011

Product Name: Phosphorus Pentoxide (All Grades)
Synonyms: Phosphorus Oxide (P2O5)
Diphosphorus Pentaoxide

Product Description: White Soft Powder, Odorless

Recommended Use: Chemical processing
Restrictions on Use: None determined

Company Identification: Special Materials Company
70 West 40th Street
New York, New York 10018
Phone: (646) 366-0400
Fax: (646) 366-0595
CHEMTREC (emergency): 800-424-9300  Outside USA: (703) 527-3887

SECTION 2 – HAZARDS IDENTIFICATION

Classification of the substance
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Inhalation (Category 2)
Skin corrosion (Category 1A)
Serious eye damage (Category 1)

Label elements
Hazard statement(s)
H314 Causes severe skin burns and eye damage.
H330 Fatal if inhaled.
EUH014 Reacts violently with water.

Precautionary statement(s)
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284 Wear respiratory protection.
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove
contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.
P363 Wash contaminated clothing before reuse.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P501 Dispose of contents/container to an approved waste disposal plant.

Hazard Pictograms

Signal word  Danger

Other Hazards  Reacts violently with water.

EMERGENCY OVERVIEW
Granular powder reacts violently with water. Corrosive, airborne dust particles are harmful and corrosive to respiratory tract. Contact with skin may cause chemical burns. Contact with eyes may cause severe irritation and chemical burns.

Hazard symbols for this product: C. Risk Phrases - R 35

POTENTIAL HEALTH EFFECTS

INHALATION
Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Breathing airborne particles or dust from mixing, spraying, sanding, grinding, etc. may cause severe irritation to respiratory tract.

SKIN
Contact may cause severe irritation and painful burns on exposed skin.

EYES
Contact with eyes will cause severe irritation and painful burns to eyes. Highly corrosive to eyes.

INGESTION
Ingestion can cause immediate burning pain in the mouth, throat, abdomen; severe swelling of the larynx and skeletal paralysis affecting the ability to breathe, circulatory shock and convulsions.

CARCINOGENICITY  NTP? No  IARC MONOGRAPHS? No  OSHA REGULATED? No
SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS#/EINECS No.</th>
<th>HAZARDOUS COMPONENTS</th>
<th>% (by weight)</th>
<th>OSHA PEL</th>
<th>ACGIH TWA</th>
<th>SARA TITLE III</th>
<th>RQ LBS</th>
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<tbody>
<tr>
<td>1314-56-3 / 215-236-1</td>
<td>Phosphorus Pentoxide</td>
<td>99.5 - 100</td>
<td>Not established</td>
<td>Not established</td>
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<td></td>
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</table>

The EU has established an OEL of 1 mg/m³ (TWA)

SECTION 4 – FIRST AID MEASURES

Most Important Symptoms
Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Breathing airborne particles or dust from mixing, spraying, sanding, grinding, etc. may cause severe irritation to respiratory tract.

Special Treatment
Treat symptomatically.

Inhalation
Remove affected person to fresh air; wash mouth and nasal passages with water repeatedly; if breathing difficulties persist seek medical attention.

Skin
Remove contaminated clothing; flush affected area with water; launder contaminated clothing before reuse; if irritation persists, seek medical attention.

Eyes
Remove contact lenses. Flush eyes with clear running water for 15 minutes while holding eyelids open; seek immediate medical attention.

Ingestion
Give large quantities of milk or water; DO NOT induce vomiting. Never give anything by mouth to an unconscious person; seek medical attention.

SECTION 5 – FIRE FIGHTING MEASURES

General fire hazards
Product is not considered flammable or combustible. Products of combustion include compounds of hydrogen, phosphorus and oxygen and toxic fumes.

Extinguishing media
Suitable extinguishing media
Carbon dioxide, dry chemical, chemical foam. Do not use water.
SAFETY DATA SHEET
Phosphorus Pentoxide (All Grades)

Unsuitable extinguishing media
Water

Special hazards arising from the substance or mixture
Product reacts violently with water. May release toxic and irritating fumes upon thermal decomposition.

Advice for firefighters
Special firefighting procedures
Runoff may cause pollution. Use media appropriate for the surrounding fire.

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

Hazardous Combustion Products
Products of combustion include compounds of hydrogen, phosphorus and oxygen and toxic fumes.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Caution - CORROSIVE. Recover and segregate product for reuse; shovel product into approved container for disposal.

Personal precautions
Use personal protective equipment. Avoid breathing dust, fumes, and vapor. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions
Do not let product enter drains.

Methods and materials for containment and cleaning up
Contain spills then collect then pick up and place in container for disposal according to local regulations. Do not flush with water.

SECTION 7 – HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep container closed when not in use; protect containers from abuse; protect from extreme temperatures. Store in cool, dry area. CAUTION - material is corrosive. Keep this and other chemicals out of reach of children.

Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

Conditions for safe storage
Store under inert gas if appropriate. Keep container tightly closed in a dry and well-ventilated place. Keep away from water. Never allow product to get in contact with water during storage. Air and moisture sensitive.
SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:
The use of local exhaust ventilation and airborne particle collection is recommended. Use corrosion-resistant ventilation equipment.

PERSONAL PROTECTION:
RESPIRATORY PROTECTION (SPECIFY TYPE):
NIOSH approved respirator designed to remove airborne particulate present in excess of maximum allowable concentrations due to secondary operations such as mixing, spraying, sanding, buffing, etc. Refer to 29 CFR 1910.134 or European Standard EN 149 for regulations.

PROTECTIVE GLOVES:
Neoprene gloves, butyl or nitrile rubber gloves with cuffs.

EYE PROTECTION:
Protective eyeglasses or chemical safety goggles. Refer to 29 CFR 1910.133 or European Standard EN166.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
Coverall, apron, or other equipment should be worn to minimize skin contact, safety eyewash station nearby.

WORK / HYGIENIC PRACTICES:
Practice safe workplace habits. Minimize body contact with this, as well as all chemicals in general.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Appearance</td>
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<tr>
<td>Odor</td>
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<tr>
<td>Odor threshold</td>
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</tr>
<tr>
<td>pH</td>
<td>1.5 (10 g/L@20°C)</td>
</tr>
<tr>
<td>Melting point</td>
<td>340°C</td>
</tr>
<tr>
<td>Initial boiling point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>10 mm Hg @ 238°C</td>
</tr>
<tr>
<td>Vapor density (Air=1)</td>
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</tr>
<tr>
<td>Relative density</td>
<td>2.3 g/mL at 25 °C (77 °F)</td>
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<tr>
<td>Solubility</td>
<td>Reacts violently with water</td>
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<tr>
<td>Partition coefficient: n-octanol/water</td>
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<tr>
<td>Auto-ignition</td>
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</tr>
<tr>
<td>Temperature</td>
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</tr>
<tr>
<td>Decomposition</td>
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</tr>
<tr>
<td>Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Solid</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET
Phosphorus Pentoxide (All Grades)

SECTION 10 – STABILITY AND REACTIVITY

Reactivity
Reacts violently with water

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Reacts violently with water

Conditions to avoid
Avoid water, moisture; generating airborne dust.

Incompatible materials
Water, organic compounds, sodium, potassium, ammonia, peroxides, magnesium, alcohols, metals, oxidizing agents. Reaction with 95% formic acid causes rapid evolution of carbon monoxide. Dry mixtures with sodium oxide, calcium oxide react violently if warmed or moistened. A reaction with sodium carbonate may be initiated by strong local heating. The addition of phosphorous pentoxide to 3-propynol results in ignition. Reacts vigorously with hydrogen fluoride, violently with iodides and sulfides, and explosively with calcium when heated.

Hazardous decomposition products
Decomposition will not occur if handled and stored properly. In case of a fire, compounds of hydrogen, phosphorus, oxygen and toxic fumes and smoke may be produced.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute toxicity
LD50 Oral: No data available
LD50 Dermal: No data available
LC50 Inhalation: 0.3mg/L/4H (Smoke) rat
Skin corrosion/irritation
Skin – rabbit: No data available

Serious eye damage/eye irritation
Eyes – rabbit: No data available

Respiratory or
skin sensitization: No data available

Germ cell mutagenicity: No data available
Reproductive toxicity: No data available
Specific target organ
toxicity - single exposure: No data available.
Specific target organ toxicity
- repeated exposure: No data available.
SAFETY DATA SHEET
Phosphorus Pentoxide (All Grades)

Aspiration hazard: No data available

Carcinogenicity
No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Likely routes of exposure: Inhalation, skin contact, and ingestion

Potential health effects

INHALATION
Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Breathing airborne particles or dust from mixing, spraying, sanding, grinding, etc. may cause severe irritation to respiratory tract.

SKIN
Contact may cause severe irritation and painful burns on exposed skin.

EYES
Contact with eyes will cause severe irritation and painful burns to eyes. Highly corrosive to eyes.

INGESTION
Ingestion can cause immediate burning pain in the mouth, throat, abdomen; severe swelling of the larynx and skeletal paralysis affecting the ability to breathe, circulatory shock and convulsions.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12 – ECOLOGICAL INFORMATION

Toxicity
Toxicity to fish: No data available
Toxicity to aquatic invertebrates: No data available

Persistence and degradability
No data available

Bio accumulative potential
No data available

Mobility in soil
No data available

Results of PBT and vPvB assessment
No data available

Other adverse effects
No data are available on the adverse effects of this material on the environment. Neither COD nor BOD data are available. Phosphorous Pentoxide will react with water in the environment to ultimately yield phosphoric acid. This material is not classified as a Marine Pollutant.

SECTION 13 – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: METHOD: Dispose of in accordance with Local, State, and Federal Regulations. Product is classified as non-hazardous, however, non-hazardous materials may become hazardous waste upon contact with other products. Refer to "40 CFR Protection of Environment Parts 260 - 299" for complete waste disposal regulations.
SAFETY DATA SHEET
Phosphorus Pentoxide (All Grades)

Consult your local, state, or Federal Environmental Protection Agency before disposing of any chemicals.

SECTION 14 – TRANSPORT INFORMATION

**Proper Shipping Name:** Phosphorus Pentoxide

**DOT Hazard Class / Pack Group:** 8 / II  
**IATA Hazard Class / Pack Group:** 8 / II  
**Reference:** 49 CFR 173.154, .212, .240  
**IMDG Hazard Class:** 8 / II  
**UN/NA Identification Number:** UN 1807  
**RID/ADR Dangerous Goods Code:** 8  
**Label:** Corrosive  
**UN TDG Class / Pack Group:** 8 / II  
**Hazard Symbols:** C  
**Hazard Identification Number (HIN):** 80

Note: Transportation information provided is for reference only. Client is urged to consult CFR 49 parts 100 - 177, IMDG, IATA, EC, United Nations TDG, and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

SECTION 15 – REGULATORY INFORMATION

**TSCA (Toxic Substance Control Act)**
All components of this product are listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory) or are exempted from listing because a Low Volume Exemption has been granted in accordance with 40 CFR 723.50.

**SARA Title III (Superfund Amendments and Reauthorization Act)**
- 311/312 Hazard Categories.
- Immediate health
- 313 Reportable Ingredients:
  - None

**CERCLA (Comprehensive Response Compensation and Liability Act)**
None

**California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986**
There are no reportable chemicals present known to the state of California to cause cancer or reproductive toxicity.

**CPR (Canadian Controlled Products Regulations)**
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. WHMIS Classification: E, D2B.

**IDL (Canadian Ingredient Disclosure List)**
Components of this product identified by CAS number and listed on the Canadian Ingredient Disclosure List are shown in Section 2.
DSL / NDSL (Canadian Domestic Substances List / Non-Domestic Substances List)
Components of this product identified by CAS number are listed on the DSL or NDSL, or are otherwise in compliance with the New Substances Notification (NSN) regulations. Only ingredients classified as "hazardous" are listed in Section 2 unless otherwise indicated.

EINECS (European Inventory of Existing Commercial Chemical Substances)
Components of this product identified by CAS numbers are on the European Inventory of Existing Commercial Chemical Substances.

<table>
<thead>
<tr>
<th>EC Risk Phrases</th>
<th>Symbol (s) Required For Label</th>
<th>EC Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>R35 Causes severe burns</td>
<td>Corrosive</td>
<td>S22 Do not breathe dust</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)</td>
</tr>
</tbody>
</table>

SECTION 16 – OTHER INFORMATION

Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on Information from similar products, the ingredients, technical literature, and/or professional experience.

HMIS HAZARD RATINGS

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>*= Chronic Health Hazard</td>
<td>0= Insignificant</td>
<td>1= Slight</td>
</tr>
<tr>
<td>2= Moderate</td>
<td>3= High</td>
<td>4= Extreme</td>
</tr>
</tbody>
</table>

Personal Protective Equipment F

Safety glasses, Gloves, Apron, Dust Respirator

Revision Summary

This SDS has been revised in the following sections: 1, 3, 5, 9, 10 and 12.

SDS Prepared by: Special Materials Company
70 West 40th Street
New York, New York 10018
Phone: (646) 366-0400 Fax: (646) 366-0595
www.smc-global.com

The information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.