

## Material Safety Data Sheet

Date: 07/14/2004 (Cytec MSDS date)

### MATERIAL SAFETY DATA SHEET

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#### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** BPD Refined (Benzene Phosphorus Dichloride)

**Synonyms:** Dichlorophenylphosphine; Phenyl phosphorus dichloride

**Chemical Family:** Phosphine Dichloride

**Molecular Formula:** C<sub>6</sub> H<sub>5</sub> Cl<sub>2</sub> P

**Molecular Weight:** 179

HB Chemical Corp., 140 E. Ascot Ln., Cuyahoga Falls, Ohio 44223 (Tel: 800-991-2436)  
For Product Information call 1-800/652-6013. Outside the USA and Canada call 1-973/357-3193.  
EMERGENCY PHONE: For emergency involving spill, leak, fire, exposure or accident call  
CHEMTREC: 1-800/424-9300. Outside the USA and Canada call 1-703/527-3887.

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#### 2. COMPOSITION/INFORMATION ON INGREDIENTS

##### OSHA REGULATED COMPONENTS

**Component / CAS No. % (w/w) OSHA (PEL): ACGIH (TLV) Carcinogen**

Benzene phosphorus

dichloride

644-97-3

98.01 Not Established Not Established -

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#### 3. HAZARDS IDENTIFICATION

##### EMERGENCY OVERVIEW

##### APPEARANCE AND ODOR:

Color: colorless

Appearance: liquid

Odor: strong

##### STATEMENTS OF HAZARD:

##### POTENTIAL HEALTH EFFECTS

##### EFFECTS OF EXPOSURE:

The acute oral (rat) LD<sub>50</sub> value is estimated to be between 500 and 2,000 mg/kg. The acute dermal (rat and rabbit) LD<sub>50</sub> values are estimated to be >2,000 mg/kg based on data reported for the hydrolysis products. This material was mutagenic in the Ames test; however, it was found not to be mutagenic in an in vivo Mouse Micronucleus Assay.

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**DANGER! CAUSES BURNS OF EYES AND SKIN**

**REACTS VIOLENTLY WITH WATER**

**CONTACT WITH MOISTURE MAY RELEASE CORROSIVE HYDROGEN CHLORIDE GAS**

Direct contact with this material may cause severe eye and skin irritation. Inhalation overexposure to the mist or vapor may cause respiratory tract irritation. Refer to Section 11 for toxicology information on the regulated components of this product.

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## 4. FIRST AID MEASURES

### **Ingestion:**

If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

### **Skin Contact:**

Remove contaminated clothing and shoes without delay. Wear impermeable gloves. Wash immediately with plenty of water. Pay particular attention to skin crevices, nail folds, etc. Do not reuse contaminated clothing without laundering.

Do not reuse contaminated leatherware. Obtain medical attention.

### **Eye Contact:**

Rinse immediately with plenty of water for at least 15 minutes. Obtain medical attention immediately.

### **Inhalation:**

Remove to fresh air. If breathing is difficult, give oxygen. Apply artificial respiration if patient is not breathing. Obtain medical attention immediately.

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## 5. FIRE-FIGHTING MEASURES

### **Extinguishing Media:**

Use carbon dioxide, dry chemical or halogenated agents. Do not use water because of reactivity.

### **Protective Equipment:**

Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing.

See MSDS Section 8 (Exposure Controls/Personal Protection).

### **Special Hazards:**

Keep containers cool by spraying with water if exposed to fire.

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## 6. ACCIDENTAL RELEASE MEASURES

### **Personal Precautions:**

Where exposure level is not known, wear approved, positive pressure, self-contained respirator.

Where exposure

level is known, wear approved respirator suitable for level of exposure. In addition to the protective

clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impermeable boots.

### **Methods For Cleaning Up:**

Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Do not use water

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in cleanup or get spilled material wet.

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## 7. HANDLING AND STORAGE

### HANDLING

**Precautionary Measures:** Do not get in eyes, on skin or on clothing. Avoid contact with moisture or water. Do not

breathe gas or vapor. Keep container closed and dry. Wash thoroughly after handling.

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Dichloride)

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**Handling Statements:** Evolves hydrogen chloride on contact with moisture. This material will corrode steel or

aluminum at a rate greater than 6.25 mm (0.25 inches/year) @ 55 °C (130 °F). It is thus considered to be a corrosive

material for transportation purposes.

### STORAGE

Keep water and moist air away from product. Keep containers tightly closed. Areas containing this material should

have fire safe practices and electrical equipment in accordance with applicable regulations and/or guidelines.

Standards are primarily based on the material's flashpoint, but may also take into account properties such as

miscibility with water or toxicity. All local and national regulations should be followed.

In the Americas, National Fire Protection Association (NFPA) 30: Flammable and Combustible Liquids Code, is a

widely used standard. NFPA 30 establishes storage conditions for the following classes of materials: Class I

Flammable Liquids, Flashpoint <37.8 °C. Class II Combustible Liquids, 37.8 °C < Flashpoint <60 °C. Class IIIa

Combustible Liquids, 60 °C < Flashpoint < 93 °C. Class IIIb Combustible Liquids, Flashpoint > 93 °C.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Engineering Measures:

Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure

and local exhaust ventilation should be provided to control exposure.

### Respiratory Protection:

Where exposures are below the established exposure limit, no respiratory protection is required.

Where exposures

exceed the established exposure limit, use respiratory protection recommended for the material and level of

exposure.

### Eye Protection:

Prevent eye and skin contact. Provide eye wash fountain and safety shower in close proximity to points of potential

exposure. Wear eye/face protection such as chemical splash proof goggles or face shield.

### Skin Protection:

Prevent contamination of skin or clothing when removing protective equipment. Wear impermeable gloves and

suitable protective clothing.

### Additional Advice:

Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use.

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Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Color:** colorless

**Appearance:** liquid

**Odor:** strong

**Boiling Point:** 224.4 °C 436 °F

**Melting Point:** Not available

**Vapor Pressure:** 10.0000mm Hg @ 98 °C

**Specific Gravity:** 1.32 @ 25 °C

**Vapor Density:** (air = 1)Not available

**Percent Volatile (% by wt.):** Not available

**pH:** Not available

**Saturation In Air (% By Vol.):** Not available

**Evaporation Rate:** Not available

**Solubility In Water:** Decomposes

**Volatile Organic Content:** Not available

**Flash Point:** 101.7 °C 215 °F Setaflash Closed Cup

**Flammable Limits (% By Vol):** Not available

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Dichloride)

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**Autoignition Temperature:** 265 °C 509 °F

**Decomposition Temperature:** Not available

**Partition coefficient (noctanol/  
water):**

Not available

**Odor Threshold:** See Section 2 for exposure limits.

## 10. STABILITY AND REACTIVITY

**Stability:** Stable

**Conditions To Avoid:** Reacts violently with water. Avoid contact with moist air or water.

Hydrolyzes

rapidly with water and atmospheric moisture to form hydrogen chloride and other corrosive hydrolysis products.

**Polymerization:** Will not occur

**Conditions To Avoid:** None known

**Materials To Avoid:** water

Strong oxidizing agents and strong bases.

**Hazardous Decomposition**

**Products:**

oxides of carbon

oxides of phosphorus

halogen acids

hydrogen chloride

carbonyl halides

## 11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION.

Toxicological information on the regulated components of this product is as follows:

California Proposition 65 Warning (applicable in California only) - This product contains (a) chemical(s) known to the

State of California to cause cancer and birth defects or other reproductive harm.

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## 12. ECOLOGICAL INFORMATION

No aquatic LC50, BOD, or COD data available.

May be toxic to aquatic organisms in the short term by lowering pH to acidic levels. Most fish and invertebrate species

are intolerant of pH lower than 5.5 for an extended period of time. This material will readily dissociate in water and be neutralized by naturally basic materials such as carbonates.

Benzene phosphorus dichloride (BPD) rapidly hydrolyzes on contact with moisture to form benzene phosphonic acid,

phenyl phosphonic acid (PPOA), the pyroforic phenyl phosphine (PP) and hydrochloric acid, which are corrosive to

eyes, skin and all mucous membranes. BPD appears to have similar acute toxicity to BPA and PPOA, with acute oral

(rat) LD50 values between 500 and 2000 mg/kg. However, in these studies, areas of necrotic tissue in the

gastrointestinal tract and areas of extensive gastrointestinal hemorrhage were noted. An acute dermal (rabbit) LD50

for BPA was reported to be >4640 mg/kg. An acute dermal (rat) LD50 for PPOA was >2000 mg/kg. Inhalation or

ingestion will cause chemical burns to the tracheal and bronchial epithelium, and higher concentrations can ulcerate

or necrotize tissue, with death due to laryngeal spasm, bronchopneumonia or pulmonary edema likely. Eye or skin

contact may cause severe irritation or burns, with possible permanent vision impairment, ulceration, or tissue

necrosis. BPD was positive in the Ames Assay.

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## 13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the Cytec

product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life,

the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et

seq) is dependent upon whether a material is a RCRA `listed hazardous waste` or has any of the four RCRA

`hazardous waste characteristics.` Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a

RCRA `listed hazardous waste`; information contained in Section 15 of this MSDS is not intended to indicate if the

product is a `listed hazardous waste.` RCRA Hazardous Waste Characteristics: There are four characteristics defined

in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see

Section 9 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For

Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations

are subject to change. State and local requirements, which may differ from or be more stringent than the federal

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regulations, may also apply to the classification of the material if it is to be disposed. Cytec encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. Cytec recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. Cytec has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

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## 14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

### US DOT

Proper Shipping Name: Phenyl Phosphorus Dichloride  
Hazard Class: 8  
Packing Group: II  
UN/ID Number: UN2798  
Transport Label Required: Corrosive  
Hazardous Substances:  
Component / CAS No. Reportable Quantity of Product (lbs)  
1,3-Dichlorobenzene 25641  
1,2-Dichlorobenzene 25641

### TRANSPORT CANADA

Proper Shipping Name: Phenyl Phosphorus Dichloride  
Hazard Class: 8  
Packing Group: II  
UN Number: 2798  
Transport Label Required: Corrosive

### ICAO / IATA

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Proper Shipping Name: Phenyl Phosphorus Dichloride  
Hazard Class: 8  
Packing Group: II  
UN Number: 2798  
Transport Label Required: Corrosive  
Packing Instructions/Maximum Net Quantity Per Package:  
Passenger Aircraft: -; forbidden  
Cargo Aircraft: 812; 30 L

### IMO

Proper Shipping Name: Phenyl Phosphorus Dichloride  
Hazard Class: 8  
UN Number: 2798  
Packing Group: II  
Transport Label Required: Corrosive

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## 15. REGULATORY INFORMATION

### INVENTORY INFORMATION

**United States (USA):** All components of this product are included on the TSCA Inventory in compliance with the Toxic Substances Control Act, 15 U. S. C. 2601 et. seq.

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This product contains a chemical substance that is subject to export notification under Section 12 (b) of the Toxic Substances Control Act, 15 U. S. C. 2601 et. seq. (This requirement applies to exports from the United States only.)

**Canada:** This product contains components not on the Domestic Substances List. These components are on the Non-Domestic Substances List.

**European Union (EU):** All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC and its amendments.

**Australia:** All components of this product are included in the Australian Inventory of Chemical Substances (AICS).

**China:** All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

**Japan:** All components of this product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese inventory.

**Korea:** All components of this product are included on the Korean (ECL) inventory or are not required to be listed on the Korean inventory.

**Philippines:** All components of this product are included on the Philippine (PICCS) inventory or are not required to be listed on the Philippine inventory.

## **OTHER ENVIRONMENTAL INFORMATION**

The following components of this product may be subject to reporting requirements pursuant to Section 313 of

CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40

CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

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### **Component / CAS No. % TPQ(lbs) RQ(lbs) S313 TSCA 12B**

1,2-Dichlorobenzene

95-50-1

0.39 NONE 100 Yes No

1,3-Dichlorobenzene

541-73-1

0.39 NONE 100 Yes No

This product does not contain any components regulated under these sections of the EPA

### **PRODUCT HAZARD CLASSIFICATION UNDER SECTION 311 OF SARA**

- Acute
- Chronic
- Reactivity

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## **16. OTHER INFORMATION**

### **NFPA Hazard Rating (National Fire Protection Association)**

Health: 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

Fire: 1 - Materials that must be preheated before ignition can occur.

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Reactivity: 2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures.

Special: Water Reactive

**Reasons For Issue:** Revised Section 3

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This information is given without any warranty or representation. We do not assume any legal responsibility for same, nor do we give permission, inducement, or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation, and verification. Before using any product, read its label.

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The information in this MSDS was obtained and copied from Cytec's MSDS number 0014848

We believe the information contained is accurate and represents the material well.

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