

**FORMULATION DIVISION**

242/P, GIDC ESTATE, PANOLI - 394 116.  
Dist. : BHARUCH, GUJARAT (INDIA)  
TEL. : (02646)- 645843/46/47/48/53/56  
FAX. : (02646) - 272213, 272255.

**MATERIAL SAFETY DATA SHEET**

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**SECTION -1 : MATERIAL IDENTIFICATION & USE**

<b>MATERIAL NAME / IDENTIFIER : PHORATE 10 G.</b>	
<b>Manufacture's Name :</b> CHEMINOVA INDIA LIMITED. <b>Street Address :</b> 242/P GIDC. PANOLI . Gujarat(INDIA). <b>City :</b> PANOLI (ANKLESHWAR). <b>Postal Code :</b> 394116 <b>Emergency Telephone :</b> (0091)2646- 645843/46/47/53/56/57	<b>Supplier's Name :</b> CHEMINOVA INDIA LIMITED. <b>Street Address :</b> 242/P GIDC. PANOLI. Gujarat(INDIA). <b>City :</b> PANOLI (ANKLESHWAR). <b>Postal Code :</b> 394116 <b>Emergency Telephone :</b> (0091)2646- 645843/46/47/53/56/57
<b>Chemical Name:</b> PHOSPHORODITHOIC ACID. methyl-2-(methylcarbomoyl)-vinyl phosphate.	<b>Chemical Identity :</b> Insecticide
<b>Trade Name &amp; Synonyms :</b> PHORATE 10 G	<b>Product Use :</b> Agricultural use as Insecticide.

**SECTION -II : HAZARDOUS INGREDIENT OF MATERIAL**

Hazardous Ingredients	Approximate concentration %	CAS number	LD 50 ( species & route)	LC50 (specify species & tests)
1. Phorate active ingradient	10%	298-02-2	Rat. Oral LD 50 of Technical grade pesticide 1 mg/kg dermal 99 mg/kg	Toxicity for rat 1 Hrs. Inhalation LC 50 of Technical grade pesticide 11 mg/ m3
2.Other ingradient	90%			

**SECTION - III:COMPONENTS AND CONTAMINANTS**

**COMPONENT: PHORATE PERCENT: 10**  
**CAS # 298-02-2**  
**EXPOSURE LIMITS :PHORATE:0.05 mg/m3 OSHA TWA(Skin),0.2 mg/m3 OSHA STEL,0.05 mg/m3**  
**ACGIH TWA (Skin),0.2 mg/m3 ACGIH STEL.**

**SECTION - IV : PHYSICAL DATA FOR MATERIAL**

<b>Physical state</b> Solid/liquid/Gas	<b>Odour</b> Appearance	<b>Odour</b> Threshold(ppm)	<b>Specific gravity</b>	
Solid	Strong mercaptan Black colour			
<b>Vapour Pressure</b>	<b>Vapour Density</b>	<b>Evaporation Rate</b>	<b>Boiling Point</b>	<b>Freezing Point</b>

Solubility in water at 25°C	pH (1% aq.solution)	Density (gm/ml)	Coefficient of water/oil distribution
	7.29 at 25°C		



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**SECTION - V : FIRE AND EXPLOSION HAZARD OF MATERIAL**

Fire and Explosion Hazard : Slight fire hazard when exposed to heat or flame.  
Flash Point : Not Applicable Flammability Class :  
Firefighting Media: Dry chemical, Carbon dioxide, halon, water spray or standard foam for larger fires, use water spray fog or standard foam.  
Firefighting : Move containers from fire area if possible. Extinguish using agent suitable for type of surrounding fire. Avoid breathing vapors and dust. Keep up wind.

**SECTION - VI : REACTIVITY DATA**

Chemical Stability : Stable under normal temperatures and pressures.  
Incompatibility : PHORATE: Oxidizers (strong): Fire and explosion hazard.  
Decomposition : Thermal decomposition product may include toxic oxides of carbon, sulfur, and phosphorus.  
Polymerization : Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

**SECTION - VII : TOXICOLOGICAL PROPERTIES OF MATERIAL**

PHORATE Tech grade pesticide: Toxicity Data: 11 mg/m<sup>3</sup>/1 hour inhalation-rat LC 50; 99 mg/kg skin-Rabbit LD 50; 2500 ug/kg Skin-Rat LD 50; 20 mg/kg Skin-Guinea pig LD 50; 1 mg/kg Oral-Rat LD 50; 6590 ug/kg Oral-Mouse LD 50; 1200 ug/kg Intravenous-Rat LD 50; 1866 ug/kg Intraperitoneal-Gerbil LD 50;  
Mutagenic data (rtecs). Reproductive effects Data: Carcinogen status: None. Acute toxicity level : Highly toxic by inhalation dermal absorption, ingestion. Target effects: Cholinesterase inhibitor. Poisoning may affect the nervous system. At increased risk from exposure: Persons with respiratory ailments, recent exposure to cholinesterase inhibitors or Impaired cholinesterase production, or liver malfunction.  
Additional data: May cross the placenta. High environmental temperatures or exposure of the chemical to visible or ultraviolet light may enhance the toxicity. Interactions with medications may occur.

**SECTION - VIII : PREVENTIVE MEASURES**

Personal protective equipments :

Gloves (specify)	Respiratory (specify)	Eye (specify)
Neoprene & PVC handgloves Disposable handgloves	Fume mask, air respirator	Safety goggles / Face Shield
Footware (specify)	Clothing (specify)	Others (specify) or
Gumboots / Safety glass	Apron, long pant, full sleeve shirt head covering.	Face shield / helmet or cap. Fume mask, cotton mask.

**Engineering controls :**

( e.g. ventilation,enclosed process etc.) specify also.

(1)Suction system with suction hood at all emission/open exposure points,connected to scrubber by ducting line is provided.

(2)Fresh air supply system with ducting lines along all the packing lines and charging area points.

(3)Sufficient number of exhaust fans,wall mounted fresh air fans,Air respirator are provided in the production area.

**Leak & spill containment procedures recommended :**

Clay / saw dust is spreaded on spilled material,spilled material is allowed to absorb.Absorbe material collected in bin for safe disposar.

**Waste disposal procedures recommended :**

Procedure:(1)Ensure technical drums are empty.(2)Empty drums of technicals to be decontamination with diluted caustic solution,then flushed with water.(3)Shift the decontaminated drum for cutting and puncturing where cutting equipment device of drums is installed.(4)The top and bottom lid of detoxified drums is seperated.(5) The detoxified drum centre portion is cut horizontally.(6)The M.S.sheet is then disposed through the approved vender.

**Handling procedures & equipment :**

Self priming pump,barrel pump,drum lifter cum tilter,and centrifugal pump through material is transfered in close condition through pipe line to avoid emission of vapor using equipment line.

**Storage requirements :**

Store in ventilated finished goods godown , with adaqueate number of fire extinguisher.

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**SECTION - IX : HEALTH EFFECTS AND FIRST AID**

**INHALATION :** Phorat technical grade pesticide - Highly toxic.

**Organophosphates:**Cholinesterase inhibitor.Acute Exposure-when inhaled, the first effects of cholinesterase inhibitors are usually respiratory and may include nasal hyperemia and watery cough,chest discomfort,dyspnea and wheezing due to increased bronchial secretions and bronchoconstriction.If sufficient amounts are absorbed,other systemic effects may begin within a few minutes or be delayed for up to 12 hours. Symptoms may include pallor,nausea,vomiting,diarrhea, abdominal cramps, headache, dizziness, ocular pain , blurred vision,miosis or in some cases,especially initially mydriasis,lacrimation,salivation,sweating,and confusion.Other reported central nervous system or neuromuscular effects may include ataxia, slurrd speech,areflexia,weakness,fatigue,fasciculation, twitching,tremors possibly of the tongue and eyelid,and eventually paralysis of the extermities and possible of the respiratory muscles.In severe cases there may also be involuntary defection and urition, cynosis,psychosis,hyperglcemia,acute pancreatitis,cardac irrregularities,pulmonary edema,unconsciousness, convulsions, and coma. Death ispremarily due to respiratory failure, although cardiovascular effects including cardiac arrest may also be implicated.Long term secquelae are rare but may include neuropsychiatric disorders and myopathy with muscle tenderness.

**CHRONIC EXPOSURE :** Repeated or prolonged exposure may results in the effects of acute exposure including the delay of neuropathy.Other effects reported in workers repeatedly exposed include impaired memory and concentration,acute psychosis, severe depressions,irritability,confusion,apathy,

emotional lability, social withdrawal, confusion, headache, speech difficulties, delayed reaction times, spatial disorientation, Nightmares, sleep walking, and drowsiness or isomnia. An influenza-like condition with headache, nausea, weakness, anorexia, and malaise has also been reported.

**FIRST AID** - Remove from exposure area to fresh air immediately. If breathing has stopped, Give artificial respiration. Maintain airway and blood pressure and administer oxygen should be performed by qualified personnel. Get medical attention immediately.

**SKIN CONTACT:** Phorate technical grade pesticide: Highly toxic.

**ORGANOPHOSPHATES:** Absorption through the skin is so rapid that death has occurred in animals within an 1-2 hours of contact.

**ORGANOPHOSPHATES:** Cholinesterase inhibitor.

**ACUTE EXPOSURE:** Localized sweating and fasciculations may occur at the site of contact. If sufficient amounts are absorbed, other effects of cholinesterase inhibition as described in acute inhalation may occur. Symptoms may be delayed 2-3 hours, but usually no more than 12 hours. The rate of absorption is increased by the presence of dermatitis or high ambient temperatures. Delayed neuropathy is also possible.

**CHRONIC EXPOSURE :** Repeated or prolonged exposure may cause effects as described in acute exposure. Some organophosphates may cause sensitization.

**FIRST AID.** remove contaminated clothing immediately. Wash contaminated areas with soap and water followed by alcohol. Emergency personnel should wear gloves and avoid contamination. Treat respiratory difficulty with artificial respiration. Get medical attention immediately.

**EYE CONTACT:** Phorate technical grade pesticide: Highly toxic.

**ORGANOPHOSPHATES.** Cholinesterase inhibitor.

**ACUTE EXPOSURE:** Direct contact may cause pain, hyperemia, lacrimation, twitching, of the eyelid, miosis and ciliary muscle spasm with loss of accommodation, blurred or dimmed vision and browache. Sometimes mydriasis may occur instead of miosis. With sufficient exposure, other symptoms of cholinesterase inhibition as described in acute inhalation may occur.

**CHRONIC EXPOSURE:** Repeated or prolonged exposure may cause effects as described in acute exposure. Some compounds have caused toxic obstruction of the nasolacrimal canals when used as miotic eyedrops.

**FIRST AID-Irrigate** eyes with water or saline solution. If symptoms of poisoning occur, treat respiratory difficulty with artificial respiration and oxygen. Observe patient for at least 24-36 hours. Get medical attention immediately. Oxygen should be administered by qualified medical personnel.

**INGESTION :** Phorate technical grade pesticide : Highly toxic.

**ORGANOPHOPHATES :** Cholinesterase inhibitor.

**ACUTE EXPOSURE :** When ingested, the first effects may be nausea, vomiting, anorexia, abdominal cramps and diarrhea. Gastrointestinal absorption may cause symptoms of cholinesterase inhibition as described in acute inhalation. Symptoms may begin within minutes or be delayed for hours. Delayed effects including neuropathy may also occur.



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**CHRONIC EXPOSURE :** Repeated ingestion may cause effects as described in acute exposure.

**FIRST AID:** If person is alert and respiration is not depressed, give syrup of ipecac followed by water ( if vomiting occurs, keep head below hips to prevent aspiration). If consciousness level declines or vomiting has not occurred in 15 minutes empty stomach by gastric lavage with the aid of cuffed endotracheal tube using isotonic saline or 5% sodium bicarbonate follow with activated charcoal. Establish and maintain airway. Treat respiratory difficulty with artificial respiration and oxygen. Do not give morphine,

aminophylline,phenothiazines,reserpine,furosemide,or ethacrynic acid.Treat symptomatically and supportively.Administration of oxygen and lavage must be performed by qualified medical personnel. Get medical attention immediately.

## **SECTION - X : ANTIDOTE**

The following antidote(s) have been recommended. However the decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel.For cholinesterase inhibitors: Establish clear airway and tissue oxygenation by aspiration of secretions,and if necessary by assisted pulmonary ventilation with oxygen.Improve tissue oxygenation as much as possible before administering atropine to minimize the risk of ventricular fibrillation.Administer atropine sulfate intravenously,or intramuscularly if iv injection is not possible.In moderately severe poisoning administer atropine sulfate 0.4 - 2.0mg repeated every 15 minutes until atropinization is achieved (Tachycardia, flushing,dry mouth,mydriasis). Miantain atropinization by repeated doses 2-12 hours,or longer,depending on the severity of poisoning.The appearance of rales in the lung bases,miosis,salivation nausea,bradycardia,are all indications of inadequate atropinization. Severly poisoned individuals may exhibit remarkable tolerance to atropine;two or more times the dosages suggested above may be needed.Persons not poisoned or only slightly poisoned,However,may develop signs of atropine toxicity from such large dosages: Fever,muscle fibrillation,and delirium are the main signs of atropine toxicity.If these signs appear while the patient is fully atropinized,atropine administration should be discontinued, atleast temporarily.Observe treated patients closely at least 24 hours to insure that symptoms (possible pulmonary edema).Do not recur as atropinization wears off.In very severe poisonings, metabiolic disposition of toxycant may require several hours or days during which atropinization must be maintained.Markedly lower levels of urinary metabolites indicate that atropine dosage can be tapered off.As dosage is reduced,check the lung bases frequently for rales.If rales are heard or other symptoms return,re-establish atropinization promptly.Administeration of antidote must be performed by qualified medical personnel.

In case of sever poisoning by organophosphate pesticides in which respiratory depression, muscle weakness and twitching are severe,give pralidoxime(protopam-ayerst,2-PAM),1.0 gram intravenously at no more than 0.5 gram per minute.Dosage of pralidoxime may be repeated in 1-2 hours,that at 10-12 hour intervals if needed.In very severe poisonings,dosage rates may be doubled.Treatment with pralidoxime will be most effective if given within thirty-six hours after poisoning.Antidote should be administered by qualified medical personnel.

## **SECTION- XI : CONDITIONS TO AVOID**

May burn but does not ignite readily.

## **SECTION- XII : SPILL AND LEAK PROCEDURES.**

OCUPATIONAL SPILL :Do not touch spilled material. Stop leak if you can do it without risk. Use water spray to reduce vapors.For small spills,take up with sand or other absorbent material and place into containers for later disposal.For small dry spills,with a clean shovel place material in to clean,dry containers and cover. Move containers from spill area.For larger spills,Dike far ahed of spill for later disposal.Keep unnecessary people away. Isolate hazard area and deny entry.Ventilate closed spaces before entering.



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## **SECTION-XIII : PROTECTIVE EQUIPMENT**

### **VENTILATION :**

(1) Suction system with suction hood at all emission/open exposure points, connected to scrubber by ducting line is provided.

(2) Fresh air supply system with ducting lines along all the packing lines and charging area points.

(3) Sufficient number of exhaust fans, wall mounted fresh air fans, Air respirator are provided in the production area.

**RESPIRATOR :** The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection. The specific respirator selected must be based on contamination levels found in the work place.

**For firefighting and other immediately dangerous to life or health condition :**

Self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode, supplied-air respirator with full facepiece and operated in pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.

**CLOTHING :** Employee must wear appropriate protective (Impervious) clothing and equipment to prevent any possibility of skin contact with this substance.

**GLOVES :** Employee must wear appropriate protective gloves to prevent contact with this substance.

**EYE PROTECTION:** Employee must wear splash-proof or dust-resistant safety goggles and a faceshield to prevent contact with this substance.

**Emergency wash facilities :** Where there is any possibility that an employee's eye and/or skin may be exposed to this substance, the employer should provide an eye wash fountain and quick drench shower within the immediate work area for emergency use.

## **SECTION-XIV : STORAGE AND DISPOSAL**

### **\* \*STORAGE \***

(1) The packages containing the insecticides shall be stored in separate rooms or premises away from the room or premises used for storing other articles or shall be kept in separate almirahs under lock and key depending upon the quantity and nature of the insecticides.

(2) The room or premises meant for storing the insecticides shall be well built, dry, well ventilated and of sufficient dimension to avoid contamination with vapour.

### **\*\*DISPOSAL \*\***

(1) The leakage/damage packages shall not be left outside to prevent their re-use.

(2) Packages and surplus material and washing should be disposed off in a safe manner so as to prevent environment or water pollution.

(3) Cartons should be torn, crushed and completely destroyed and then disposed off safely.

(4) Disposable of detoxified plastic bag: Toxic material from empty plastic bags is totally collected. These empty bags are washed with caustic solution, then with fresh water. These detoxified bags are cut horizontally and vertically and tied in bundles. It is then disposed through the approved vendors.