Gharda Chemicals Limited

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Pilot® 4E** Chlorpyrifos Agricultural Insecticide

EPA Registration No: 33658-26

Gharda Chemicals Limited
660 Newtown-Yardley Rd.
Newtown, PA 18940

Emergency Response Telephone Numbers
For Spills Call: CHEMTREC 1-(800)-424-9300
For Medical Call: 1-(866)-359-5660

2. COMPOSITION / INFORMATION ON INGREDIENTS

	CAS No.	(% w/w)	PEL/TLV
Chlorpyrifos O,O-Diethyl O-(3,5,6-trichloro-2-pyridinyl) phosphorothioate	2921-88-2	45.0	0.2 mg/m^3 (skin)
Inert ingredients, including:		55.0	NA
Aromatic 150 or 150 ND or 200	64742-95-6		
Proprietary surfactants	Blend		

Chemical Class: Organophosphate insecticide

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:

- EPA Signal Word: WARNING
- Light yellow liquid with petroleum distillate odor.
- Cholinesterase inhibitor.
- May be fatal if swallowed.
- Harmful if absorbed through the skin.
- Causes moderate eye irritation and/or corneal eye injury.
- Avoid contact with eyes, skin, or clothing.
- Thermal decomposition and burning may form toxic by-products.
- For exposure to fire, wear protective equipment.
- Toxic to fish, aquatic invertebrates, small mammals, and birds.

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

Single dose oral toxicity is moderate. May cause moderate eye irritation and slight corneal injury. Vapors may irritate eyes. Prolonged exposure may cause moderate skin irritation.

Excessive exposure to vapors may cause irritation to upper respiratory tract and lungs, and central nervous system depression. Signs and symptoms of central nervous system depression in order of increasing exposure are headache, dizziness, drowsiness, and in-coordination.

Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure to chlorpyrifos may be headache, dizziness, incoordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, and convulsions.

4. FIRST AID MEASURES

IF INHALED: Remove person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

IF SWALLOWED: Call a poison control center or doctor immediately for treatment advice. Do not give any liquid to the person. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

NOTE TO PHYSICIAN: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration. **Note**: Contains Petroleum Distillate – vomiting may cause aspiration pneumonia.

5. FIRE FIGHTING MEASURES

FLASH POINT: 176-181°F

FLAMMABILITY LIMITS IN AIR (% by Vol.): Lower: 1% Upper: 6% (Solvent)

NFPA 704 HAZARD CODES: Health: 2 Flammable: 2 Reactivity: 1

EXTINGUISHING MEDIUM: Water fog or fine spray, carbon dioxide, dry chemical or foam. Alcohol resistant foams (ATC type) are preferred if available. General-purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively.

MEDIA TO AVOID: Do not use direct water stream.

FIRE FIGHTING PROCEDURES: Keep people away. Isolate fire area and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Eliminate ignition sources. Consider feasibility of a controlled burn to minimize environmental damage. Foam fire extinguishing system is prefered because uncontrolled water can spread possible contamination. Burning liquids may be moved by flushing the water to protect personnel and minimize property damage. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider use of unmanned hose holder or monitor nozzles. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of re-ignition has passed. Immediately withdraw all personnel from area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. Contain fire water run- off if possible. Fire water run-off, if not contained may cause environmental damage.

PROTECTIVE EQUIPMENT FOR FIREFIGHTERS: Wear positive pressure, self-contained breathing apparatus (SCPA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). If protective equipment isn't available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO TAKE FOR SPILLS/LEAKS: Absorb spills with an absorbent material such as HAZORB, ZORBALL, or dirt. Thoroughly wash body areas, which come in contact with this product. Contain spill to keep out of sewers. Report large spills to CHEMTREC: 1 (800) 424-9300. Vapor explosion hazard, keep out of sewers. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Pump with explosion-proof equipment. If available, use foam to smother or suppress.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: WARNING. May be fatal if swallowed. Harmful if absorbed through the skin. Causes moderate eye irritation. Keep out of reach of children. Do not swallow. Do not get in eyes, on skin, or on clothing. Avoid breathing spray mist and vapors. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion proof equipment may be necessary, depending upon the type of operation. No smoking, open flames or sources of ignition in handling and storage area. Minimize sources of ignition, such as static buildup, heat, spark, or flame. Store in original container with the lid tightly closed.

8. PERSONAL PROTECTION

EXPOSURE GUIDELINE(S):

Chlorpyrifos: ACGIH TLV and OSHA PEL are 0.2 mg/m^3 (Skin).
ACGIH classification is A4.

PEL's are in accord with those recommended by OSHA, as in the 1989 revision of PELs. A "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material. It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

VENTILATION: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guideline.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required use a NIOSH approved air-purifying or positive-pressure supplied air respirator depending on the potential airborne concentration. For emergency and other conditions where the exposure guideline may be greatly exceeded, use a NIOSH approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full-body suit will depend on operation. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse. Contaminated leather items, such as shoes, belts and watchbands, should be removed and destroyed.

EYE/FACE PROTECTION: Use chemical goggles. Refer to the product label for additional personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	Light yellow
Physical State:	Liquid
Odor:	Slight, petroleum-like
Boiling Point @ 760mm Hg:	456°F (236°C)
pH:	5.5 (as aqueous dispersion)
Density:	8.9 lbs/gal
Vapor Pressure mm Hg @ 38°C:	2

10. STABILITY AND REACTIVITY

STABILITY: Unstable at elevated temperatures.

CONDITIONS TO AVOID: Avoid heating above 122°F (50°C). Chlorpyrifos undergoes exothermic decomposition at approximately 266°F (130°C) which can lead to higher temperatures and violent decomposition if generated heat is not removed. Generation of gas during decomposition can cause pressure in closed systems. Contains petroleum derivative solvent which will burn.

CHEMICAL INCOMPATIBILITY: Avoid contact with oxidizing materials and bases.

HAZARDOUS DECOMPOSITION: Hazardous decomposition products may include and are not limited to hydrogen chloride, ethyl sulfide, diethyl sulfide and nitrogen oxides.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION

EYE: May cause moderate eye irritation and slight corneal injury. Vapors may irritate eyes.

SKIN CONTACT: Prolonged exposure may cause moderate skin irritation. A test in guinea pigs indicated that this product may have weak skin sensitization potential; however, experience in the manufacture and use of this product has not provided evidence for skin sensitizing properties. The product did not sensitize human subjects when tested at an end-use dilution. A single prolonged exposure is not likely to result in the material being

absorbed through the skin in harmful amounts. The LD_{50} for skin absorption in rabbits is >5000 mg/kg. Repeated exposure may cause skin irritation and allergic skin reactions in some individuals.

INGESTION: Single dose oral toxicity is moderate. The oral LD_{50} for male and female rats is 776 and 300 mg/kg, respectively. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing amounts larger than that may cause injury. If aspirated (liquid enters the lungs), may cause lung damage or even death due to chemical pneumonia.

INHALATION: The LC_{50} for rats is greater than 2.7 mg/l for 4 hours. Excessive exposure may cause irritation to upper respiratory tract and lungs, and central nervous system depression. Signs and symptoms of central nervous system depression in order of increasing exposure are headache, dizziness, drowsiness, and in-coordination.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure to chlorpyrifos may be headache, dizziness, in-coordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions. Chlorpyrifos produced mild adrenal effects when fed to rats, but only at doses that greatly exceeded any exposures that would be received during use of this product.

CANCER INFORMATION: Chlorpyrifos did not cause cancer in long-term animal studies. Xylene was not found to be carcinogenic in a National Toxicology Program bioassay in rats and mice.

TERATOLOGY (BIRTH DEFECTS): Chlorpyrifos did not cause birth defects in laboratory animals.

REPRODUCTIVE EFFECTS: Chlorpyrifos did not interfere with fertility in reproduction studies in laboratory animals. Some evidence of toxicity to the offspring occurred, but only at a dose high enough to produce significant toxicity to the parent animals.

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): Results of in-vitro (test tube) and animal mutagenicity tests on the aromatic solvent have been negative. Based on a majority of negative data and some equivocal or marginally positive results, the active ingredient is considered to have minimal mutagenic potential.

The following ingredients contained in the solvent are cited on the lists below:

Chemical Name	CAS Number	List Cited
NAPTHALENE	91-20-3	NTP SUS; JARC 2B

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL HAZARDS: This pesticide is toxic to fish, aquatic invertebrates, small mammals and birds. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Cover or incorporate spills. Do not contaminate water when cleaning equipment of disposing of equipment water or rinsate. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

ENVIRONMENTAL DATA/MOVEMENT AND PARTITIONING:
Bioconcentration potential is moderate (BCF is between 100 and 3000 or Log P_{OW} between 3 and 5).

DEGRADATION & PERSISTENCE (Based on information for chlorpyrifos):
The photolysis half-life in water is 3-4 weeks. In the atmospheric environment, material is estimated to have a tropospheric half-life of 1.4 hours. Degradation is expected in the soil environment within days to weeks. Under aerobic soil conditions the half-life is generally 30-60 days.

ECOTOXICOLOGY

Based on information for chlorpyrifos:
Material is very highly toxic to aquatic organisms on an acute basis (LC_{50}/EC_{50} < 0.1 mg/L in most sensitive species. Material is highly toxic to birds on a dietary basis (LC_{50} between 50 and 500 ppm). Material is moderately toxic to birds on an acute basis (LD_{50} between 51 and 500 mg/kg.

Based on information for Aromatic 150/150ND:
Aromatic 150/150ND is expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

Open dumping is prohibited. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

14. TRANSPORT INFORMATION

PROPER SHIPPING NAME: Organophosphorous Pesticides, Liquid, Toxic (Chlorpyrifos)

HAZARD CLASS OR DIVISION: 6.1

IDENTIFICATION NUMBER: UN 3018

PACKING GROUP: III

ADDITIONAL INFORMATION: As per DOT Regulations, Chlorpyrifos is designated as a Marine Pollutant and has a Reportable Quantity (RQ) of 1 pound (0.454 kg).

15. REGULATORY INFORMATION

SARA (311/312) Reportable Hazard Categories: Fire Delayed Health

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

Chemical Name	CAS Number	Concentration (%/wt)
AROMATIC 150		
Pseudocumene (1,2,4-Trimethylbenzene)	000095-63-6	<1.7%
Napthalene	000091-20-3	<9.9%
AROMATIC 150ND		
Napthalene	000091-20-3	<9.9%

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard
A fire hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

Chemical Name	CAS Number	List
Pseudocoumene (1,2,4-Trimethylbenzene)	000095-63-6	NJ RTK, NJ RTK, PA RTK, ACGIH ALL, OSHA Z, TSCA 4, TSCA 12b, CA P65 CARC, IL RTK, MN RTK
Napthalene	000091-20-3	ACGIH ALL, IL RTK, MN RTK, PA RTK, RI RTK
Chlorpyrifos	002921-88-2	NJ3, PA1, PA3

NJ3 = New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).
PA1 = Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%).
PA3 = Pennsylvania Environmental Hazardous Substance (present at greater than or equal to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): This product contains the following substance(s) listed as "Hazardous.

Substances" under CERCLA that may require reporting of releases:

Chemical Name	CAS Number	RQ	% in Product
Chlorpyrifos	002921-88-2	1	45%
Aromatic 150/150N	064742-94-5	(CIRCLA Petroleum Exclusion applies for this solvent)	

16. OTHER INFORMATION

Issue Date: October 20, 2010

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, expressed or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state, and local laws and regulations.