MATERIAL SAFETY DATA SHEET

1. Chemical Product and Company Information

Product Name : **CHLORPYRIFOS TECHNICAL**
Chemical Name : ***O, O*-diethyl *O*-3,5,6-trichloro-2-pyridyl phosphorothioate**
Chemical Formula : **$C_9H_{11}Cl_3NO_3PS$**
Mol. Wt. : **350.6**
Chemical Family : **Carbamate**
Use : **Insecticide & Termiticide**
Company : **HPM Chemicals & Fertilizers Ltd.**
Address : **209-219, Anupam Bhawan, Azadpur Commercial Complex, Azadpur, Delhi- 110033**
Telephone : **(011)-45071800, 899**
Fax : **(011)- 27681800**
Website : **www.hpmindia.com**
e-mail : **info@hpmindia.com**

2. Composition / Information on Ingredients

Chemical Name	CAS No	Concentration [%]
Chlorpyrifos: O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) phosphorothioate	**002921-88-2**	**95% minimum**
Inert Ingredients	**----------**	**5% maximum**

3. Hazards Identification

Shipping Name : Poison Chlorpyrifos 2921-88-2
Shipping Code/ Label: 3017 / 6.1 Carrier: NA
Hazardous Waste ID No. 15

EMERGENCY OVERVIEW
Hazardous chemical. Colourless crystalline solid with Mild mercaptan odor.
POTENTIAL HEALTH EFFECTS:
EYE: Essentially non-irritating to the eyes.
SKIN: Prolonged contact is essentially non-irritating to the skin. Did not cause allergic skin reactions when tested in guinea pigs. The LD_{50} for skin absorption in rats is >4000 mg/kg.
INGESTION: Single dose oral toxicity is extremely low. The oral LD_{50} for rats is 135 mg/kg. If aspirated, may cause lung damage or even death due to chemical pneumonia.
INHALATION: Vapors are unlikely due to physical properties. Excessive exposure to mists of the petroleum distillate may cause respiratory and eye irritation.

CANCER INFORMATION: Chlorpyrifos did not cause cancer in laboratory studies.
TERATOLOGY (BIRTH DEFECTS): Chlorpyrifos did not cause birth defects; other fetal effects occurred only at doses toxic to the mother.

4. First Aid Measures

EYES: Flush with plenty of water for 5 minutes.
SKIN: Wash thoroughly with soap and water.
INGESTION: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.
INHALATION: Remove to fresh air if effects occur. Consult a physician.

Antidotes / Dosage: Inject atropine IV or IM (0.4-2.0 mg/Kg.) every 15 min. until atropinised or Universal antidote (A mixture containing 2 parts activated charcoal, 1 part MgO and 1 part tannic acid in 300 ml warm water.
Antidote: ATROPINE. Seek medical attention at once in all cases of suspected poisoning.

5. Fire Fighting Measures

FLASH POINT:	>180 ºC
Flammability LEL % v UEL % v	DNA
TDG Flammability:	Not Pertinent
Explosion sensitivity to impact :	No
Explosion Sensitivity to Static Electricity :	Yes
Auto ignition Temp. :	DNA
Combustible Material :	Yes
Explosive Material:	No
Hazardous Polymerization:	No
Flammable Material : Yes	**Oxidizer :** No
Corrosive Material: No	**Pyrophoric Material :** No
Organic Peroxide:	No,

Hazardous Combustion Products: When heated to decomposition, it emits toxic fumes of NOx, POx, SOx, Cl-
HAZARDOUS COMBUSION PRODUCTS: Under fire conditions some components of this product may decompose. Hazardous combustion products may include and are not limited to sulfur oxides, phosphorus compounds, nitrogen oxides, hydrogen chloride, carbon monoxide, and carbon dioxide.
EXTINGUISHING MEDIA: To extinguish combustible residues of this product use carbon dioxide, dry chemical or foam.

6. Accidental Release Measures

ACTION TO TAKE FOR SPILLS/LEAKS: Absorb small spills with dry material such as sand, Saw Dust. Wash thoroughly after handling. Contain spill by diking to keep out of sewers.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store in original container in secured dry storage area. Prevent cross-contamination with other pesticides or fertilizers. Store below 70°C. Keep out of reach of children. Avoid contact with eyes and skin. Do not ingest this product.

8. Exposure Controls/Personal Protection

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.
EXPOSURE GUIDELINE(S): Chlorpyrifos: ACGIH TLV and OSHA PEL are 0.2 mg/M3, Skin. PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.
ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING

WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline.

SKIN PROTECTION: No precautions other than clean body-covering clothing should be needed.

EYE PROTECTION: Use safety glasses.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. Physical and Chemical Properties

Physical State:	Crystaline solid
Melting/Freezing Point ^{0}C:	42-43 ^{0}C
Boiling Point:	NA
Vapor Pressure at 20°C mmHg:	2.7 mPa (25 ^{0}C)
Vapor Density (Air=1):	NA
Solubility In Water at 30°C:	In Water: 1.4 mg/lit at 25^{0}C
Bulk Density:	1.44 (20 ^{0}C)
pH:	6.4 – 6.8
Appearance:	Colourless
Odor:	Mild mercaptan

10. Stability and Reactivity

STABILITY: Stable under recommended storage conditions. Unstable at elevated temperatures. See "Storage" section of this MSDS.

CONDITIONS TO AVOID: Avoid temperatures above 70°C. Chlorpyrifos decomposes at elevated temperatures.

HAZARDOUS DECOMPOSITION: Hazardous decomposition products depend upon temperature, air supply and the presence of other materials.

INCOMPATIBLE MATERIALS: Avoid contact with oxidizing materials and bases.

11. Toxicological Information

a) Acute Oral:	201 mg/kg (rats)
b) Acute Dermal:	>2000 mg/kg (rats)
c) Acute Inhalation**:**	>4 mg/l (rats) [a.i.]
d) Acute Other routes:	No Data applicable

MUTAGENICITY: Based on a majority of negative data and some equivocal or marginally positive results, chlorpyrifos is considered to have minimal mutagenic potential.

12. Ecological Information

ENVIRONMENTAL FATE MOVEMENT & PARTITIONING:

Based largely or completely on information for chlorpyrifos. Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Expected to be relatively immobile in soil (Koc >5000).

DEGRADATION & PERSISTENCE:

Based largely or completely on information for chlorpyrifos.

The photolysis half-life in water is 3-4 weeks.
In the atmospheric environment, material is estimated to have a topospheric 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:
Avian oral toxicity: Mallard duck 76.6 mg/Kg. Toxic to bees. Aquatic Toxicity:-3.0 ppm / Rainbow trout /TLm/fresh water,
Material is highly toxic to birds on a dietary basis (LC50 between 50 and 500 ppm).
Material is moderately toxic to birds on an acute basis (LD50 between 51 and 500 mg/kg).
PERSISTENCE:-Half life period in natural water at 25 °C and pH 8 is 1.5 days.

13. Disposal Considerations

DISPOSAL METHOD: Do not contaminate food, feed, or water by storage or disposal. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of law. Pesticide, spray mixture, or rinse water that cannot be used according to label instructions must be disposed of in accordance with applicable local, state or federal requirements.

14. Transport Information

For DOT regulatory information, if required, consult transportation regulations, product-shipping papers.

15. Regulatory Information

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express 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 or provincial, and /or local laws.

16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are resented in good faith and believed to be correct. This information applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produces formulations containing this product, it is the recipient's sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS. Accordingly, no guarantee or warrantee expressed or implied is made by HPM Chemicals & Fertilizers Ltd., as to the results to be obtained based upon the user's use of the information, nor does HPM Chemicals & Fertilizers Ltd., assume any liability arising out of user's use of the information.
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