



FMC INDIA PRIVATE LIMITED
EMBASSY STAR 8, 1 ST FLOOR, PALACE ROAD
HIGH GROUNDS, BANGALORE,
KARNATAKA -560052 (INDIA)
PHONE NO: +91-22-6704 5404

Page 1 of 7

MATERIAL SAFETY DATA SHEET

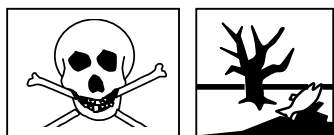
CHLORPYRIPHOS 20% EC

(Durmet TC)

Table of Contents:

- | | | | |
|----|--|-----|----------------------------------|
| 1. | Identification of the substance/preparation and of the company/undertaking | 9. | Physical and chemical properties |
| 2. | Composition/information on ingredients | 10. | Stability and reactivity |
| 3. | Hazards identification | 11. | Toxicological information |
| 4. | First aid measures | 12. | Ecological information |
| 5. | Fire-fighting measures | 13. | Disposal considerations |
| 6. | Accidental release measures | 14. | Transport information |
| 7. | Handling and storage | 15. | Regulatory information |
| 8. | Exposure controls/personal protection | 16. | Other information |

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING



Toxic

Dangerous
for the
environment

Product Name: **CHLORPYRIPHOS 20 % EC**
(Durmet TC)
Supplier: **FMC INDIA PRIVATE LIMITED**
Embassy star 8, 1st Floor
Palace Road, High Grounds
Bangalore
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Emergency +91-22-6704 5404
Telephone No. +91-22-6704 5404

2. COMPOSITION/INFORMATION ON INGREDIENTS

2.1. ACTIVE INGREDIENT:

CAS Name	Phosphorothioic acid, O-O-diethyl O-(3,5,6-trichloro-2-pyridinyl) ester
Other Name	O,O-Diethyl O-(3,5,6-trichloro-2-pyridinyl)phosphorothioate
ISO Name	Chlorpyrifos
CAS No.	2921-88-2
Molecular Weight	350.59
Empirical Formula	C ₉ H ₁₁ Cl ₃ NO ₃ PS

2.2.	Typical Content	Chlorpyrifos	20 % by weight
		Adjuvants etc.	80 % by weight

2.3. Structural Formula

2.4. Material Use Insecticide



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Page 2 of 7

3. HAZARDS IDENTIFICATION

- | | |
|---|--|
| 3.1. Health Hazards (Acute and Chronic) | Chlorpyrifos is a dangerous poison (cholinesterase inhibitor). It rapidly enters the body on contact with all skin surfaces and eyes. Clothing contaminated with material must be removed immediately and all skin washed thoroughly. Exposed persons must receive prompt medical treatment.
Repeated exposures to cholinesterase inhibitors such as Chlorpyrifos may, without warning, cause increased susceptibility to doses of any cholinesterase inhibitor. |
| 3.2. Signs and Symptoms of Exposure | Headache, nausea, vomiting, cramps, weakness, blurred vision, pin-point pupils, tightness in chest, laboured breathing, nervousness, sweating, watering of eyes, drooling or frothing of mouth and nose, muscle spasms and coma. |
| 3.3. Environmental Hazards | See 12. |

4. FIRST AID MEASURES

- | | |
|---|--|
| 4.1. Emergency and First Aid Procedures | Call a doctor (physician). Clining or hospital immediately. Explain that the victim has been exposed to Chlorpyrifos, an organophosphorus insecticide, and describe his/her condition. Move victim immediately from the area where the product is present.
If breathing has stopped, start respiration immediately and maintain until physician takes charge of the exposed person. If swallowed and the exposed person is conscious, make him/her vomit quickly. Have the exposed person drink 1 or 2 glasses of water and induce vomiting by touching the back of throat with finger. Repeat until vomit is clear. Never give anything by mouth to an unconscious person. Make the exposed person lie down and keep him/her steady. Get medical attention immediately. |
| 4.2. Note to Physician | Chlorpyrifos is a cholinesterase inhibitor affecting the central and peripheral nervous systems producing cardiac and respiratory depression.
Antidote : Administer atropine sulfate in large doses. TWO to FOUR mg intravenously or intramuscularly as soon as cyanosis is overcome. Repeat at 5 to 10 minute intervals until signs of atropinisation appear.
Obidoxime Chloride (Toxogonin) is a pharmacological antidote and may be administered as an adjunct to, but not a substitute for atropine, which is a symptomatic and often lifesaving antidote. DO NOT GIVE MORPHINE OR TRANQUILLIZERS.
At first sign of pulmonary oedema, the patient should be given supplemental oxygen and treated symptomatically.
Continued absorption of Chlorpyrifos may occur and relapse may occur after initial improvement. VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS. |



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Page 3 of 7

5. FIRE-FIGHTING MEASURES		
5.1.	Extinguishing Media and Procedure	Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Fight fire from protected location or maximum possible distance. Avoid heavy hose streams. Dike area to prevent water runoff. Fireman should wear self-contained breathing apparatus and protective clothing.
5.2.	Hazardous Decomposition or Byproducts in a Fire	The essential breakdown products are: hydrogen chloride, ethyl mercaptan, diethyl sulfide, sulfan dioxide, nitrogen oxides and various chlorinated and protective clothing.
5.3.	Unusual Fire and Explosion Hazards	See 10.1.
6. ACCIDENTAL RELEASE MEASURES		
6.1.	Personal Protection	Observe all protection and safety precautions when cleaning up spills, see 8.
6.2.	Steps to Be Taken in Case of Spill	Small spills on the floor or other impervious surface should be swept up. Scoop into proper containers and dispose of in accordance with the instructions provided under Disposal (see 13). Rinse area with soda lye. Large spills on the floor or other impervious surface should be contained. Collect the spill, place in a metal drum and dispose of in accordance with the instructions provided under Disposal (see 13). Rinse area with soda lye. Large spills that soak into the ground should be dug up, placed in metal drums and disposed of in accordance with instructions provided under Disposal (see 13). Clorpyrifos can be hydrolysed in water by heating and adjusting the pH (alkaline). The product may also be disposed of through proper incineration.
7. HANDLING AND STORAGE		
7.1.	Precautions to Be Taken in Handling	See Personal Protection, Section 8.
7.2.	Precautions to Be Taken in Storing	The product is stable when stored in coated, unopened drums at ambient temperature. The content is not affected when kept at 54°C for a period of 14 days. The product should not be heated above 55°C. Local heating above this temperature should be avoided as well. Protect against strong heat from sunshine or other sources, e.g. fire..
7.3.	Fire and Explosion Precautions	---



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Page 4 of 7

8. EXPOSURE CONTROLS/PERSONAL PROTECTION		
8.1.	Respiratory Protection	In case of insufficient ventilation, wear a respirator in conformity with local regulations..
	Protective Gloves	Wear chemical resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber or viton.
	Eye Protection	Wear safety glasses.
	Other Protection	Wear water-proof pants, coat, hat , rubber boots or rubber overshoes..
8.2.	Work/Hygienic Practices	If handled indoors, provide mechanical exhaust ventilation. Persons working with this product for a longer period should have frequent blood tests of their cholinesterase levels. If the cholinesterase level falls below a critical point, no further exposure should be allowed until it has been determined by means of blood tests that the cholinesterase level has returned to normal. Keep all unprotected persons and children away from working area. Before removing gloves wash them with soap and water. Always wash hands, face and arms with soap and water before smoking, eating or drinking. After work, take off all work clothes and shoes. Shower, using soap and water. Wear only clean clothes when leaving job. Do not wear contaminated clothing. Wash protective clothing and protective equipment with soap and water after each use. Respirator should be cleaned and filter replaced according to instructions included with respirator.
9. PHYSICAL AND CHEMICAL PROPERTIES		
9.1.	Physical State	Liquid
9.2.	Colour	Colourless to Pale yellow
9.3.	Odour	Aromatic odour
9.4.	Melting Point	---
9.5.	Boiling Point	160 - 210°C.
9.6.	Specific Gravity (at 27°C.)	0.91 – 0.95
9.7.	Vapour Pressure	Chlorpyrifos : 1.87 X 10 ⁻⁵ mm Hg at 25°C : 8.15 X 10 ⁻⁵ mm Hg at 35°C
9.8.	Viscosity	5 cps max
9.9.	Solubility in Water	Insoluble in water and to be used as such formulation
9.10.	Solubility in Organic Solvents	Soluble in polar organic solvents, like acetone, ethanol, etc
9.11.	Partition Coefficient n-Octanol/Water	Chlorpyrifos : 4.700
9.12.	pH (1 % solution in water)	7.01 at 25°C
9.13.	Flash Point	Above 45°C
9.14.	Autoignition Temperature	Not available
9.15.	Flammable Limits	Not available

10. STABILITY AND REACTIVITY

- 10.1. Thermal Decomposition Chlorpyrifos will decompose rapidly when heated to temperatures above 160 °C, significantly increasing the risk of inducing explosion.
- The decomposition is dependent on time as well as temperature due to exothermic and autocatalytic reactions. The reactions involve rearrangements and polymerization releasing volatile malodorous and inflammable compounds such as diethyl sulfide.
- 10.2. Hazardous Decomposition or Byproducts See 5.2.
- 10.3. Materials to avoid Strong alkalis, amines and strong oxidizing compounds. The product is corrosive to iron, steel, tin plate and copper.

11. TOXICOLOGICAL INFORMATION

- 11.1. Health Hazards See 3.1.
- 11.2. Acute Toxicity Chlorpyrifos
- | | | | | |
|-------------------|--------------|------------------------------------|---|-----------------|
| Route(s) of Entry | - Ingestion | LD ₅₀ , oral, rat (M) | : | 135-163 mg/ Kg. |
| | - Skin | LD ₅₀ , dermal, rat | : | >2000 mg/ Kg. |
| | - Inhalation | LC ₅₀ , inhalation, rat | : | >0.20 mg/l |
- 11.3. Irritancy of Material Mildly irritating to skin and eyes.
- 11.4. Allergic Sensitization No sensitizing reaction in guinea pigs.
- 11.5. Carcinogenicity No carcinogenic effects are found for Chlorpyrifos.
- 11.6. Reproductive Effects No effects on reproductivity are found for Chlorpyrifos.
- 11.7. Teratogenicity Chlorpyrifos is not teratogenic in rats at levels up to 15 mg/kg/day (a maternally toxic level).
- 11.8. Mutagenicity Chlorpyrifos is not mutagenic.

12. ECOLOGICAL INFORMATION

The active ingredient Chlorpyrifos is readily biodegradable. It undergoes rapid degradation in the environment and in wastewater treatment plants. No adverse effects are found at concentrations up to 100 mg/l in wastewater treatment plants. Degradation occurs both aerobically and anaerobically, biologically as well as abiotically.

In the environment Chlorpyrifos is not mobile, but is strongly absorbed to soil. Chlorpyrifos is toxic to birds, fish and aquatic invertebrates. The acute toxicity is :

- Fish	96-h LC ₅₀ , Rainbow trout (<i>Salmo gairdneri</i>).....	3 µg/l
- Invertebrates	48 h-LC ₅₀ , Daphnids (<i>Daphnia magna</i>).....	1.7 µg/l
- Birds	LD ₅₀ , Bobwhite quail (<i>Colinus virginianus</i>).....	13.3 mg/kg
	LD ₅₀ , Mallard duck (<i>Anas platyrhynchos</i>).....	75.6 mg/kg
- Bees	LD ₅₀ , Honey bees (<i>Apis mellifera</i>), acute oral.....	0.36 µg/bee,
	LD ₅₀ , Honey bees (<i>Apis mellifera</i>), topical.....	0.070 µg/bee

13. DISPOSAL CONSIDERATIONS

- 13.1. Waste Disposal Method Spill and waster disposal procedures in conformity with state and local regulations must be followed.
- Do not contaminate water, foodstuffs, feed or seed by storage or disposal.
- 13.2. Container Disposal Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill. However, procedures in conformity with state and local regulations must be followed.

14. TRANSPORT INFORMATION

UN Classification
Proper Shipping Name Organophosphorus Pesticide, Liquid, Toxic (Chlorpyrifos),
6.1, UN 3018
No. 3018
Class 6.1
Packing Group III
Primary / Subsidiary label Keep away from food.
Primary / Subsidiary Palcard Keep away from food.
Marine Pollutant (P/PP) Marine Pollutant
(IMDG-Code)

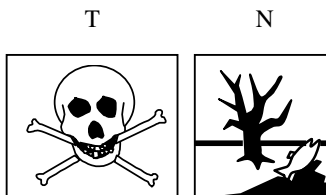
15. REGULATORY INFORMATION

15.1. IN THE EU:

Classification and Labelling

(according to 67/548/EEC with amended):

Danger Symbol



Toxic

Dangerous
For the
Environment

Contains

R - Phrases

S - Phrases

Chlorpyrifos

R/24/25-50/53: Toxic in contact with skin and if swallowed. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S28-36/37-45-60-61 : After contact with skin, wash immediately with plenty of water and soap. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/ Safety data sheets.



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Page 7 of 7

15.2.	Threshold Limit Value	OSHA PEL (USA)	Australia	United Kingdom	HGV (Denmark)
		0.2mg/m ³	0.2mg/m ³	0.2mg/m ³	0.2mg/m ³

However, threshold limit values defined by local regulations must be observed.

16. OTHER INFORMATION

This material should only be used by persons who have been instructed in all safety precautions required and otherwise are familiar with content of data sheet.

Emergency Telephone Number +91-22-6704 5404

Address :

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