MATERIAL SAFETY DATA SHEET

1. Chemical Product and Company Information

Product Name	**: DELTAMETHRIN TECHNICAL**
Chemical Name	**: *S*)-α-cyano-3-phenoxybenzyl (1*R*,3*R*)-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylate**
Chemical Formula	**: $C_{22}H_{19}Br_2NO_3$**
Mol. Wt.	**: 505.2**
Chemical Family	**: Pyrethroid**
Use	**: Insecticide**
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 [%]
Deltamethrin:*S*)-α-cyano-3-phenoxybenzyl (1*R*,3*R*)-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylate	**52918-63-5**	**98 %**
Inert Ingredients/Impurities	**----------**	**Q.S.**

3. Hazards Identification

Hazard Description: Highly Toxic (USA) Toxic (EU)
Dangerous for the environment
Harmful in contact with skin; readily absorbed through skin system
Toxic by inhalation. Very toxic if swallowed
May cause sensitization by inhalation and skin contact
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
Target organ(s): central nervous system, cardiovascular system
Information pertaining to particular dangers for man and environment:
HMIS Ratings: Health =1 Flammability =0 Reactivity =0

4. First Aid Measures

EYES: Flush with plenty of water for 5 minutes.
SKIN: Flush with copious amounts of water; remove contaminated clothing and shoes; call a physician.
INGESTION: If swallowed, wash out mouth with copious amounts of water; call a physician.
INHALATION: If inhaled, remove to fresh air; if breathing is difficult, give oxygen; if breathing stops, give artificial respiration.
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.

5. Fire Fighting Measures

FLAMMABILITY: Not easily flammable
FLASH POINT (^{0}C): 58 ^{0}C
AUTO - IGNITION TEMP.(^{0}C): Not Applicable
LOWER EXPLOSION LIMIT: Not Explosive

SUITABLE EXTINGUISHING AGENTS: water spray, carbon dioxide, dry chemical powder or foam Protective equipment: wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
UNUSUAL FIRE HAZARD: may emit toxic fumes under fire conditions.
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.

6. Accidental Release Measures

PERSON-RELATED SAFETY PRECAUTIONS: cordon off area of spill; wear self-contained breathing apparatus, protective clothing and heavy rubber gloves.
MEASURES FOR CLEANING/COLLECTING: absorb solutions with finely-powdered liquid-binding material (diatomite, universal binders); decontaminate surfaces and equipment by scrubbing with alcohol; dispose of contaminated material according to Section 13.

7. Handling and Storage

INFORMATION FOR SAFE HANDLING: avoid contact with skin, eyes and clothing; material may be an irritant.
STORAGE: Store solid and solutions at room temperature..

8. Exposure Controls/Personal Protection

Breathing equipment: NIOSH/MSHA-approved respirator
Protection of hands: chemical-resistant rubber gloves
Eye protection: chemical safety goggles.

9. Physical and Chemical Properties

PHYSICAL STATE:	Crystals
APPEARANCE:	Colourless
ODOUR:	Characteristic of mineral spirit
SPECIFIC GRAVITY / DENSITY (Water = 1) (g/ml):	Bulk density 0.55 g/cm^3 (25 oC)
VAPOUR PRESSURE AT 25 ^{0}C:	1.24 x 10-5 mPa (25 °C)
VAPOUR DENSITY (Air=1):	Not Available
BOILING RANGE/POINT ^{0}C:	NA
MELTING/FREEZING POINT ^{0}C:	100-102 ^{0}C
SOLUBILITY IN WATER:	In water <0.2 mg/l (25 °C).
pH:	4 – 5

10. Stability and Reactivity

Chemical Stability: Stable
Hazardous polymerization: Will not occur.
Stability: Avoid acids and bases
Thermal decomposition / conditions to be avoided: protect from light and heat
Dangerous products of decomposition: thermal decomposition may produce toxic gases such as carbon monoxide and carbon dioxide.

11. Toxicological Information (Technical)

a) Acute Oral: 135 mg/kg (rats)
b) Acute Dermal: >2000 mg/kg (rats)
c) Acute Inhalation: >2.2 mg/l (rats) [a.i.]
d) Acute Other routes: No Data applicable
e) Eye Irritation: Mild eye damage.
f) Skin Irritation: Non irritation.
Other Studies: Non-mutagenic and non-teratogenic (mice, rats, rabbits).

12. Ecological Information (Technical)

ECOTOXICOLOGICAL INFORMATION
ACUTE AND LONG-TERM TOXICITY TO FISH AND INVERTEBRATES:
This pesticide is toxic to fish and aquatic invertebrates. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor drift from treated area. Drift or runoff from treated fields may be hazardous to aquatic organisms in areas near the application site. Do not contaminate water by cleaning of equipment or disposal of equipment wash waters.
This product is toxic to bees exposed to direct treatment. Do not apply it, or allow it to drift, to crops or weeds on which bees are actively foraging.
FISH TOXICITY:
96 hour LC_{50}, Rainbow trout – 0.91µg/l, bluegill sunfish 1.4µg/l.
AVIAN TOXICITY:
Acute oral LD_{50} for mallard ducks >4640 mg/kg.
Dietary LC_{50} (8 d) for mallard ducks >8039, quail >5620 mg/kg diet.
BEE TOXICITY: Toxic to bees.
LD_{50} (oral) 79 ng/bee; (contact) 51 ng/bee.
ENVIRONMENTAL FATE
The major routes of dissipation are soil binding and soil microbial degradation. Although soil binding is strong, it is not immediate. It appears that spray drift is the only significant route of exposure to aquatic organism. Additionally, its insolubility in water will be a factor in limiting its bioconcentration as well. Deltamethrin hydrolyzes under alkaline conditions. Leaching studies indicate that deltamethrin is immobile.

THE FOLLOWING DATA WERE DEVELOPED WITH: Technical Deltamethrin
Water Solubility: < 0.20 micrograms/L @ 25°C
Hydrolytic Half-Life: 2.28-2.70 days @ pH 9.0
Photolytic Half-Life: 64-86 days (water); 9 days (soil)

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

DOT Hazard Class:	6.1, (3)
Proper shipping name:	none
Non-Hazardous for transport:	This substance is considered to be non-hazardous.
Packaging Group:	III
Proper shipping name:	none

15. Regulatory Information

Code letter and hazard designation of product:
Hazard-determining components of labeling:
EU Risk and Safety phrases:
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S28: After contact with skin, wash immediately with plenty of water
S29: Do not empty into drains
S36/37/39: Wear suitable protective clothing, gloves, and eye/face protection
S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
S53: Avoid exposure - obtain special instructions before use
R21: Harmful in contact with skin
R23: Toxic by inhalation
R27/28: Very toxic in contact with skin and if swallowed.

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.

Prepared by: HPM Chemicals & Fertilizers Ltd., Safety Division

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