

PRALLETHRIN SAFETY DATA SHEET

Date of issue: January 1st, 2007

Former edition date: January 1st, 2006

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY/UNDERTAKING (*)

1.1 Identification of the substance:

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| Trade name: | Prallethrin |
| Chemical names: | <ul style="list-style-type: none"> • (S)-2-methyl-4-oxo-3-prop-2-ynylcyclopent-2-enyl (1R)-cis-trans-2,2-dimethyl-3-(2-methylprop-1-enyl) cyclopropanecarboxylate (IUPAC) • prallethrin (international common name) • Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, (1S)-2-methyl-4-oxo-3-(2-propynyl)-2-cyclopent-1-yl ester, (1R)- (CA INDEX NAME, 9CI) |
| Other names: | Prallethrin, ETOC ® (trade name registered by Sumitomo Chem. Co.) |
| CAS No.: | 23031-36-9 for unresolved stereochemistry; 204244-85-9 for d-cis,trans of d-isomer or d-Prallethrin |
| EC No.: | 245-387-9 |
| Chemical Family: | Pyrethroid |
| Molecular Formula: | C ₁₉ H ₂₄ O ₃ |
| Molecular Mass: | 300.40 |

1.2 Use of the substance: Active ingredient for insecticide formulations.

1.3 Company/undertaking identification

| | |
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| Name and address: | ENDURA S.p.A. - Viale Pietramellara, 5 - 40121 Bologna (Italy) |
| Telephone Number / Telefax Number: | +39 051 5281711 / +39 051 557255 |
| E-mail address of the competent person responsible: | atagliani@endura.it |
| 1.4 Emergency telephone: | +39 348 8073239 (ENDURA S.p.A. - Viale Pietramellara, 5 - 40121 Bologna - Italy); otherwise, contact the official competent body of the Member State where the emergency has occurred. |

2. HAZARDS IDENTIFICATION (*)

According to Directive 67/548/EEC and all subsequent amendments, the substance prallethrin is classified as follows:

T, Toxic; R23 - Xn, Harmful; R22 - N, Dangerous for the environment; R50/53.

The substance may cause some toxic effects to man and hazards to various aquatic species.

The stabilizer, cited in Heading 3, is classified as dangerous (Xn; R20/21/22 - Xi; R36/37/38), but is present in a concentration which does not change the toxicological profile of the substance, as can be verified when applying the Dir. 1999/45/EC.

The information shown on the label is reported in Heading 15.

3. COMPOSITION/INFORMATION ON INGREDIENTS (*)

The commercial product "Prallethrin" contains 93% or more of stereoisomers of the substance prallethrin and a stabilizer having the following characteristics:

| <u>Chemical name</u> | <u>CAS No.</u> | <u>EC No.</u> | <u>Symbols of danger</u> | <u>Risk phrases</u> | <u>Concentration</u> |
|--------------------------|----------------|---------------|--------------------------|----------------------|----------------------|
| Butylated Hydroxytoluene | 128-37-0 | 204-881-4 | Xn, Xi | R20/21/22, R36/37/38 | 2.0 % |

4. FIRST AID MEASURES

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| Inhalation: | Move affected person from contaminated area to fresh air. If the affected person is not breathing, provide artificial respiration. In the case of laboured breathing, provide oxygen and obtain medical aid. |
| Skin contact: | Remove contaminated clothing and wash affected areas with plenty of water and soap. Contact a physician if irritation occurs. |
| Eye contact: | Remove contact lenses, if present. Flush eyes with plenty of water for 15 minutes. Try to open the eyelids. It is advisable to contact a physician if irritation persists. |
| Ingestion: | Contact a poison control centre or a physician immediately. Administer the injured person 1 or 2 glasses of water, if conscious. Vomiting may be induced, keeping the injured's head bent down, in order to prevent vomit inhalation through the respiratory apparatus. Do not administer anything to unconscious people. |

5. FIRE-FIGHTING MEASURES (*)

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| Suitable extinguishing media: | Foam, CO ₂ , chemical powders, water mist. |
| Unsuitable extinguishing media: | Jets of water. |
| Special exposure hazards in a fire: | As for all organic materials, combustion may lead to formation of hazardous oxides of carbon and other toxic fumes. |
| Special protective equipment for fire-fighters: | Wear a self-contained respiratory apparatus; wear protective clothing in order to avoid contact with the skin and the eye. |
| Other instruction: | Cool fire-exposed containers with water mist and avoid environmental contamination with extinguishing water. |

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6. ACCIDENTAL RELEASE MEASURES (*)

Personal precautions:

Wear suitable clothing as reported in Heading 8.

Environmental precautions:

Avoid soil and water contamination. In the case of environmental contamination, inform the authorities.

Methods for cleaning up:

Soak up with sand or other absorbent material; collect thoroughly into suitable containers. Wash the contaminated area with a soapy solution; collect waste waters for treatment.

7. HANDLING AND STORAGE (*)

7.1 Handling:

Handle only when suitable ventilation is available. Avoid contact with eyes, skin and clothing. Avoid ingestion or inhalation. Wash hands and exposed skin after work. Do not eat, drink or smoke during use.

7.2 Storage

Requirements of storage rooms:

The product is not affected by the variation of temperature normally reached in a warehouse owing to seasonality. However, it should be stored in a closed, dry and well-ventilated area.

Electrical equipment in warehouses or formulation departments should conform to the local norms for combustible products.

Storage conditions:

Keep away from food, drinks or animal feedingstuffs. Protect from light, heat and naked flames.

The substance is stable under normal atmospheric conditions and has a shelf life of minimum 3 years from manufacturing, if properly packed and stored. Storage in closed containers is recommended, preferably in those adopted by the supplier (i.e. UN approved steel drums lined with epoxy-phenolic resins).

Do not stack palletised drums in more than 3 vertical layers.

Packaging material to be avoided:

Unlined iron and other metals (copper, brass, bronze).

Recommended packaging material:

Polyethylene (in particular F-HDPE, HDPE or co-extruded PE); dark glass; coated steel (epoxy-phenolic or polyvinyl-fluoride resins).

Only for short period storages: other plastic materials, tinplate, lined steel or aluminium.

7.3 Specific uses:

The substance is not intended for end-users, but to the chemical industry only.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION (*)

8.1 Exposure limit values:

No specific limit value (i.e. STEL, TWA, etc.) has been officially established for the substance.

A calculated value, with a safety factor of 100, is the following:

AOEL (Acceptable Operator Exposure Level): 2.5 mg/kg bw/day

8.2 Exposure controls

8.2.1 Occupational exposure controls:

Appropriate equipment should be used. In particular, a safety eyebath should be available at the workplace as well as localised ventilation systems. These should be designed for maintaining the eventual concentration of product in the air below the limit established by the local norms.

(a) Respiratory protection:

If fixed ventilation systems are not available, a mask with filter for organic vapours/particles should be worn during use (it is advisable to adopt devices complying with the EN 14387:2004 and EN 149:2001 norms).

(b) Hand protection:

Suitable rubber gloves (nitrile, vinyl or neoprene) should be worn during use; it is advisable to adopt devices complying with the EN 374-1,2,3:2003 norms (recommended protection factor 4). Avoid getting gloves soaked and replace if contaminated.

(c) Eye protection:

Safety glasses or goggles should be worn during use (it is advisable to adopt devices complying with the EN 166:2001 norm).

(d) Skin protection:

Wear suitable clothing; it is advisable to adopt devices complying with the EN 340:2003 norm. Regarding rubber boots and aprons, it is possible to refer to the EN ISO 20345:2004 and EN 14605:2005 norms respectively. Avoid getting boots soaked; replace contaminated clothing.

8.2.2 Environmental exposure controls:

Vapours should be conveyed to suitable scrubbing systems.

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9. PHYSICAL AND CHEMICAL PROPERTIES (*)

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| 9.1 General information | |
| Appearance; odour: | Yellow to brown viscous liquid; slight phenolic odour. |
| 9.2 Important information | |
| pH: | The pH of an 1% aqueous emulsion is about 6.1 at 20 °C. |
| Boiling point/boiling range: | No boiling point was observed, only decomposition phenomena at 160° C and 220 °C. |
| Flash point: | 150 °C (Pensky-Martens closed cup). |
| Explosive or Oxidising properties: | Non-explosive; not applicable. |
| Vapour pressure: | < 1.5 x 10 ⁻⁷ hPa at 25 °C |
| Relative density: | 1.03 at 20 °C |
| Solubility in water: | 4.88 mg/L at 20 °C |
| Solubility in organic solvents: | > 1 kg/L (n-hexane and methanol) at 25 °C |
| Partition coefficient n - octanol/water: | Log P _{ow} > 2.78 |
| 9.3 Other information | |
| Melting point/melting range: | From - 16 to - 18 °C (freezing point) |
| Auto-ignition temperature: | 325 °C |
| Volatility: | 0.00015 mL/m ³ |

10. STABILITY AND REACTIVITY

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| 10.1 Conditions to avoid: | The substance is not sensitive to shock, moisture, pressure or temperature. Sources of ignition should however be avoided. Do not expose to temperatures higher than 60 °C in order to avoid the degradation of lined containers. Do not expose to light for avoiding loss of the substance concentration. |
| 10.2 Materials to avoid: | The substance degrades when in contact with strong alkalis and acids, without generating hazardous products. |
| 10.3 Hazardous decomposition products: | Combustion is the only reaction that may lead to hazardous decomposition products (i.e. oxides of carbon and other toxic fumes). |

11. TOXICOLOGICAL INFORMATION (*)

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| Acute Oral Toxicity: | LD ₅₀ (rat): 640 (males) and 460 (females) mg/kg bw LD ₅₀ (rat): 2500 mg/kg bw (cut off value - proprietary study) |
| Acute Dermal Toxicity: | LD ₅₀ (rat): > 2000 mg/kg bw |
| Acute Inhalatory Toxicity: | LC ₅₀ (rat): > 0.47 mg/L air (4 h) |
| Corrosion: | Non-corrosive. |
| Eye and Dermal Irritation: | Non-irritating. |
| Skin sensitisation: | Non-sensitising. |
| Long-term toxicity: | Non-carcinogenic, non-mutagenic, non-teratogenic, non-toxic to reproduction. |

12. ECOLOGICAL INFORMATION (*)

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| 12.1 Ecotoxicity | |
| Acute toxicity to fish: | LC ₅₀ (<i>Brachydanio rerio</i>): 17.6 µg/L (96 h) |
| Acute toxicity to aquatic invertebrates: | EC ₅₀ (<i>Daphnia magna</i>): 19 µg/L (48 h) |
| Toxicity to algae: | E _b C ₅₀ (<i>Scenedesmus subspicatus</i>): 4.9 mg/L (72 h) |
| Acute toxicity to birds: | LD ₅₀ (<i>Colinus virginianus</i>): 1171 mg/kg |
| Acute toxicity to beneficial insects: | Very toxic to bees. |
| Effects on microbiological activity in sewage treatment plants: | No significant inhibitory effect (< 15%) on microbiological activity occurs at concentrations up to and including 1000 mg/L. |
| 12.2 Mobility | |
| Surface tension: | 34.0 mN/m and 47.8 mN/m at 20° C for saturated aqueous solution |
| Adsorption/desorption on soil: | The value of the log K _{oc} (3.12) indicates that the substance is mobile and is not absorbed by organic carbon in soil. |
| 12.3 Persistence and degradability | |
| Biodegradability: | The substance was found to be not biodegradable under the test conditions within 28 days. |
| Hydrolysis; photolysis: | Significant degradation was not observed during 30 days at pH 5 and 7. The substance is not stable at pH 9 (half-life = 118 hours at room temperature). The substance is unstable to light; half-life=13.6 hours. |
| 12.4 Bioaccumulative potential | |
| Bioconcentration: | Calculating from the log P _{ow} of 4.49, the BCF is 12.8. This value suggests that the potential for bioconcentration in aquatic organisms is low. (1) |
| 12.5 Results of PBT assessment | Not available. |
| 12.6 Other adverse effects | None. |

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13. DISPOSAL CONSIDERATIONS (*)

Product: Product wastes belong to classes H6 (toxic wastes) and H14 (eco-toxic wastes) and should be disposed of in accordance with the relevant European norms. Incineration is suggested.

Empty packaging: Empty containers are considered waste of the same class of the contents and should be disposed of in accordance with the relevant European norms.

14. TRANSPORT INFORMATION

Transport within user's premises: Normal precautions for stable and non-reactive products should be adopted.

Transport outside user's premises (identification, classification, packaging group)
Land transport: UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Prallethrin), 9, III.
Kemler Code: 90.

Sea transport: Not scheduled; it may be considered a marine pollutant.

Air transport: Not scheduled.

15. REGULATORY INFORMATION (*)

Classification: T; R23 - Xn; R22 - N; R50/53 (official classification: Dir. 2004/73/EC, 29th ATP)
T; R23 - N; R50/53 (self-classification according to data of Endura's property)

Health, safety and environmental information shown on the label (EC label)
Warning Symbols: T, N: Toxic, Dangerous for the environment.

Risk phrases: R22: Harmful if swallowed.
R23: Toxic by inhalation.
R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety advice: S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S60: This material and its container must be disposed of as hazardous waste.
S61: Avoid release to the environment. Refer to special instructions/safety data sheets.

16. OTHER INFORMATION (*)

Full text of relevant R phrases referred to
Headings 2 and 3: R20/21/22: Harmful by inhalation, in contact with skin and if swallowed.
R36/37/38: Irritating to eyes, respiratory system and skin.

Technical contact point: Additional information (particularly that relevant to land transport information) for complying with national regulations on the approximation of standards, laws or administrative provisions throughout the Community may be provided upon request by ENDURA S.p.A., Viale Pietramellara, 5 - 40121 Bologna - Italy.

Sources of key data: - Studies sponsored by Endura.
- BPD Dossier as amended up to the latest version.
- The Pesticide Manual, 13th Ed.
- WHO Specifications and Evaluations for Public Health Pesticides: Prallethrin (WHO/743/2002).
- ADR/RID 2007.
- IMDG (IMO) Code 2004 Ed., Amend. 32-04.
- DGR (IATA) 48th Ed., apart from relevant State and Operator Variations.

The data in which note (1) appears have been obtained by applying the method of calculation EPI SuiteTM v3.12 (2004), owned by the U.S. Environmental Protection Agency.

Revised information in respect to the previous edition: The sections in which information has been added, deleted or revised have been marked with (*).

This sheet has been issued with the purpose of providing users with the information necessary for a proper handling and storing of the substance and has been compiled with specific reference to the guidelines established by Directives 67/548/EEC, 89/686/EEC, 91/155/EEC, 91/689/EEC, 94/62/EC, 98/24/EC as amended up to the date of the present edition.

Disclosure or use of data for reasons different from those mentioned above (i.e., for registration purposes) must be preliminary approved by Endura.

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