



MERCK

Merck Animal Health
One Merck Dr.
Whitehouse Station, NJ 08889

MATERIAL SAFETY DATA SHEET

Merck Animal Health urges each user or recipient of this MSDS to read the entire data sheet to become aware of the hazards associated with this material.

SECTION 1. IDENTIFICATION OF SUBSTANCE AND CONTACT INFORMATION

MSDS NAME: Ectiban EC Insecticide

SYNONYM(S): Atroban 5.7% EC
Durvet Ectiban EC
Ectiban 5.7% EC
Universal-Coop Ectiban EC

MSDS NUMBER: SP000858

EMERGENCY NUMBER(S): (908) 423-6000 (24/7/36) English Only

Transportation Emergencies - CANUTEC:
(613) 996-6666 (Canada)

INFORMATION: Animal Health Technical Services:
(888) 306-0069 (Canada)

MERCK MSDS HELPLINE: (800) 770-8878 (US and Canada)
(908) 473-3371 (Worldwide)
Monday to Friday, 9am to 5pm (US Eastern Time)

SECTION 2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Liquid
Clear, Amber
Aromatic odor
Combustible.
May be irritating to respiratory system.
May be an aspiration hazard if ingested.
May cause sensitization by skin contact.
May cause effects to:
central nervous system
gastrointestinal tract
respiratory system
cardiovascular system
Extremely toxic to fish and aquatic organisms.

POTENTIAL HEALTH EFFECTS:

SECTION 2. HAZARDS IDENTIFICATION

This product is a permethrin insecticide and contains petroleum distillates. This product was practically not irritating to the skin and eyes of animals.

This product contains permethrin, a synthetic Type I pyrethroid ester. Occupational exposure to permethrin has induced temporary skin and facial sensations (feelings of numbness and tingling). Workers exposed to permethrin have also reported irritative symptoms, such as itching and burning of the skin, itching and irritation of the eyes, and irritation of the upper respiratory tract as well as increased nasal secretions. Anaphylactic reactions including bronchospasm and shock may occur in very sensitive individuals. Ingestion of large amounts may cause central nervous system effects resulting in seizures, coma, and respiratory arrest.

Ingestion of pyrethroid esters has caused stomach pain, nausea and vomiting, headache, dizziness, numbness and tingling, anorexia, fatigue, tremors, and intermittent convulsions.

Ingestion of mineral oil may cause laxative effect, nausea, dehydration or lipid pneumonia. Long-term dermal exposure to mineral oil may cause dermatitis and oil acne.

Solvent Naphtha (Petroleum) Light Aromatic may cause lung damage and severe stomach irritation if swallowed. Prolonged repeated skin contact may result in defatting of the skin and skin irritation. Inhalation, oral or dermal exposure could lead to respiratory irritation, dizziness, nausea and loss of consciousness. Petroleum distillates may be skin, eye, and respiratory tract irritants. Repeated skin contact may cause oil acne or dermatitis. Exposure to large amounts of petroleum distillates by inhalation or ingestion may cause CNS depression or excitement, headaches, drowsiness, nausea, vomiting, diarrhea, laxative effects, lung damage, or an irregular heartbeat. Aspiration of liquid into the lungs may produce chemical pneumonitis.

LISTED CARCINOGENS

Permethrin technical is classified by IARC as a Group 3 carcinogen (unclassifiable as to carcinogenicity in humans).

SECTION 3. COMPOSITION AND INFORMATION ON INGREDIENTS

PRODUCT USE: Veterinary product

CHEMICAL FORMULA: Mixture.

The formulation for this product is proprietary information. Only hazardous ingredients in concentrations of 1% or greater and/or carcinogenic ingredients in concentrations of 0.1% or greater are listed in the Chemical Composition table. Active ingredients in any concentration are listed. For additional information about carcinogenic ingredients see Section 2.

CHEMICAL COMPOSITION

INGREDIENT	CAS NUMBER	PERCENT
Permethrin Technical	52645-53-1	5.7
Light Mineral Oil	8042-47-5	50-60
Solvent Naphtha (Petroleum), Light Aromatic	64742-95-6	20-30
Cip Rinse Water	7732-18-5	5

SECTION 4. FIRST AID MEASURES

INHALATION: Remove to fresh air. If any trouble breathing, get immediate medical attention. Administer artificial respiration if breathing has ceased. If irritation or symptoms occur or persist, consult a physician.

SKIN CONTACT: In case of skin contact, while wearing protective gloves, carefully remove any contaminated clothing, including shoes, and wash skin thoroughly with soap and water. If irritation or symptoms occur or persist, consult a physician.

EYE CONTACT: In case of eye contact, immediately rinse eyes thoroughly with plenty of water. If wearing contact lenses, remove only after initial rinse, and continue rinsing eyes for at least 15 minutes. If irritation occurs or persists, consult a physician.

INGESTION: Rinse mouth and drink a glass of water. Do not induce vomiting unless under the direction of a qualified medical professional or Poison Control Center. If symptoms persist, consult a physician.

NOTE TO PHYSICIAN: This product is a permethrin insecticide and contains petroleum distillates. Vomiting is contraindicated due to the possibility of aspiration pneumonia.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABILITY DATA:

Flash Point: 51.1 deg C (124 deg F) (Seta flash)

SPECIAL FIRE FIGHTING PROCEDURES:

Wear full protective clothing and self-contained breathing apparatus (SCBA).

SUITABLE EXTINGUISHING MEDIA:

Water spray, carbon dioxide, dry chemical, halon or foam.

See Section 9 for Physical and Chemical Properties.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Keep personnel away from the clean-up area. Wear appropriate personal protective equipment as specified in Section 8.

SPILL RESPONSE / CLEANUP:

All spills should be handled according to site requirements and based on precautions cited in the MSDS. In the case of liquids, use proper absorbent materials. For laboratories and small-scale operations, incidental spills within a hood or enclosure should be cleaned by using a HEPA filtered vacuum or wet cleaning methods as appropriate. For large dry or liquid spills or those spills outside enclosure or hood, appropriate emergency response personnel should be notified. In manufacturing and large-scale operations, HEPA vacuuming prior to wet mopping or cleaning is required.

ENVIRONMENTAL PRECAUTIONS:

This product is very toxic to aquatic organisms. Do not allow product to reach ground water, water course, sewage or drainage systems.

See Sections 9 and 10 for additional physical, chemical, and hazard information.

SECTION 7. HANDLING AND STORAGE

HANDLING:

Avoid skin and eye contact. Avoid breathing mist. Keep containers adequately sealed during material transfer, transport, or when not in use. Wash face, hands, and any exposed skin after handling. Do not eat, drink, or smoke when using this substance or mixture.

Appropriate handling of this material is dependent on many factors, including physical form, duration and frequency of process or task, and effectiveness of engineering controls. Site-specific risk assessments should be conducted to determine the feasibility and the appropriateness of all exposure control measures. See Section 8 (Exposure Controls) for additional guidance.

STORAGE:

Store in a cool, dry, well ventilated area.

See Section 8 for exposure controls and additional safe handling information.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

EXPOSURE CONTROLS

The health hazard risks of handling this material are dependent on many factors, including physical form, duration and frequency of process or task, and effectiveness of engineering controls. Site-specific risk assessments should be conducted to determine the feasibility and the appropriateness of all exposure control measures. Exposure controls for normal operating or routine procedures follow a tiered strategy. Engineering controls are the preferred means of long-term or permanent exposure control. If engineering controls are not feasible, appropriate use of personal protective equipment (PPE) may be considered as alternative control measures. Exposure controls for non-routine operations must be evaluated and addressed as part of the site-specific risk assessment.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):

Respiratory Protection: Respiratory protective equipment (RPE) may be required for certain laboratory and large-scale manufacturing tasks if potential airborne breathing zone concentrations of substances exceed the relevant exposure limit(s). Workplace risk assessment should be completed before specifying and implementing RPE usage. Potential exposure points and pathways, task duration and frequency, potential employee contact with the substance, and the ability of the substance to be rendered airborne during specific tasks should be evaluated. Initial and ongoing strategies of quantitative exposure measurement should be obtained as required by the workplace risk assessment. All RPE must conform to local and regional specifications for efficacy and performance. Consult your site or corporate health and safety professional for additional guidance.

Skin Protection: Gloves that provide an appropriate barrier to the skin are recommended if there is potential for contact with this material. Consult your site safety staff for guidance.

Eye Protection: Safety glasses with side shields. Use of goggles or full face protection may be required based on hazard, potential for contact, or level of exposure. Consult your site safety staff for guidance.

Body Protection: In small-scale or laboratory operations, lab coats or equivalent protection is required. Disposable Tyvek or other dust impermeable suit should be considered based on procedure or level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance.

In large-scale or manufacturing operations, disposable Tyvek or other dust impermeable suit is recommended and based on level of exposure. Use of additional PPE such as shoe coverings, gauntlets, hood, or head covering may be necessary. Consult your site safety staff for guidance.

EXPOSURE LIMIT VALUES

INGREDIENT	CAS NUMBER	ACGIH TLV (TWA)	OSHA PEL (TWA)
Light Mineral Oil	8042-47-5	5 mg/m ³	5 mg/m ³

No exposure limits are available for the active ingredient(s) or any other hazardous ingredient in this formulation.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

FORM: Liquid
COLOR: Clear, Amber
ODOR: Aromatic odor
pH: 6.69
VAPOR PRESSURE: 15 mmHg @ 25 deg C
SPECIFIC GRAVITY: 0.870-0.880 at 25 deg C
SOLUBILITY:

Water: Emulsifies to a milky, white solution.

See Section 5 for flammability/explosivity information.

SECTION 10. STABILITY AND REACTIVITY

STABILITY/ REACTIVITY:
 Stable under normal conditions.

INCOMPATIBLE MATERIALS / CONDITIONS TO AVOID:
 Open flames and high temperatures. Oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS / REACTIONS:
 Hydrogen chloride (HCl). Carbon monoxide (CO).

SECTION 11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY DATA

SECTION 11. TOXICOLOGICAL INFORMATION

PRODUCT / CHEMICAL NAME	EXPOSURE ROUTE	STUDY DESCRIPTION	RESULT
Ectiban 5% EC Insecticide	Inhalation	LC50 (rat)	> 11.3 mg/L
	Oral	LD50 (rat)	> 5000 mg/kg
	Eye	Eye Irritation (rabbit)	Practically not irritating
	Dermal	Skin Irritation (rabbit)	Not irritating

INHALATION:

Rats exposed to an aerosol of Ectiban 5% EC at a maximum attainable concentration of 11.3 mg/L for 1 hour, exhibited ocular and respiratory irritation. No mortality was observed.

DERMAL AND RESPIRATORY SENSITIZATION:

Permethrin: Moderate skin sensitizer in animals.

REPEAT DOSE TOXICITY DATA

SUBCHRONIC / CHRONIC TOXICITY:

In sub-chronic studies ranging from 14 days to 26 weeks, rats and mice were treated with oral dosages of permethrin up to 10,000 mg/kg. Dose-dependent effects such as an increase in liver/body weight ratio, hypertrophy of the liver, and clinical signs of poisoning such as tremor were observed. The no-observed effects-level (NOEL) in rats ranged from 20 mg/kg diet (in studies lasting 90 days or 6 months) to 1500 mg/kg diet (in a 6-month study). Chronic studies ranging from 1 to 2 years were conducted in rats, mice and dogs. Dosages varied with species ranging from 1 mg/kg/day to 375 mg/kg/day of permethrin. Target organs of toxicity were the liver (increased liver weight and hepatocellular swelling), lung (increased weight), and testes (decreased weight). Depression and increased mortality were observed in mice at 75 mg/kg/day and above. Additional signs and symptoms of toxicity in the rat include hyperexcitation, sparring behavior, aggressiveness, enhanced startle response, whole body tremor and prostration.

Female rats received mineral oil in the diet at dosages up to 20,000 ppm for 90 days. Effects observed included increased liver, kidney, and spleen weights, and enlargement of the lymph nodes together with granulomatous lipid granules.

Solvent Naphtha (Petroleum) Light Aromatic was evaluated in a 13 week oral (gavage) study conducted in rats and a 13 week oral (capsule) study conducted in dogs [NOEL: <500 mg/kg/day (rat); 125 mg/kg/day (dog)].

Aromatic naphtha (boiling point range of 392 to 480° F) or Aromatic naphtha (boiling point range of 311 to 392° F) or both: Inhalation subchronic studies ranging from 78 to 150 days in rats and primates were performed at dosages ranging from 50 ppm to 1000 ppm. Effects observed in these studies included decreased weight gain, equilibrium disturbances, tremors, hair loss, dry skin, diarrhea, face and eye irritation, bone marrow changes, DNA and myelocytic depression, decreased white blood cell count, increased or changed erythrocyte activity, hemorrhaging, and/or lung, liver, spleen and kidney congestion.

REPRODUCTIVE / DEVELOPMENTAL TOXICITY:

In a three-generation reproductive study with permethrin, rats were administered doses ranging from 25 to 125 mg/kg/day. Systemic effects observed in the offspring were seen in the liver (hepatocyte hypertrophy and eosinophilia) and eye (infantile glaucoma). Body tremors were observed in the parents and offspring at 125 mg/kg/day. No teratogenic effects, maternal toxicity or fetotoxicity were observed in rats and rabbits administered 200 and 400 mg/kg/day, respectively, of permethrin.

Maternal toxicity without signs of teratogenic or embryotoxic effects was observed in pregnant rats and mice given Solvent Naphtha (Petroleum) Light Aromatic at doses as high as 1250 mg/kg/day and 1500 ppm, respectively, during gestation. Maternal toxicity was observed at all dose levels tested. Similarly, a 3-generation inhalation study in rats (1500 ppm) and an 8-day inhalation study in pregnant rats (400 ppm) caused maternal toxicity without signs of adverse effects on reproductive parameters.

MUTAGENICITY / GENOTOXICITY:

Permethrin was negative in a bacterial mutagenicity study (Ames) and in a mammalian mutagenicity study (mouse lymphoma).

Solvent Naphtha (Petroleum), Light Aromatic was negative in the Ames bacterial mutagenicity test and the bone marrow micronucleus test.

CARCINOGENICITY:

Six carcinogenicity assays, three each in mice and rats, were conducted with permethrin. No tumorigenicity was seen in rat studies. However, species specific increases in pulmonary adenomas, a common benign tumor of mice with a high spontaneous background incidence, were seen in the three mouse studies. In one of these studies, there was an increased incidence of pulmonary alveolar cell carcinomas and benign liver adenomas when permethrin was administered in the diet at 5,000 ppm.

There was no evidence of carcinogenicity in animals exposed to mineral oil mist at 100 mg/m³ or higher for as long as two years.

SECTION 12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA

INGREDIENT ECOTOXICITY

Permethrin:96-hr LC50 (rainbow trout): 0.1 to 314 ug/L
Permethrin: 96-hr LC50 (brook trout): 2.3 to 5.2 ug/L
Permethrin: 96-hr LC50 (channel catfish): 1.1 ug/L
Permethrin: 48-hr EC50 (daphnid): 0.2 to 22 ug/L

ENVIRONMENTAL DATA

MSDS NAME: Ectiban EC Insecticide

MSDS NUMBER: SP000858

Latest Revision Date: 10-Oct-2011

Page 5 of 7

OTHER INGREDIENT ENVIRONMENTAL DATA:

Permethrin is readily biodegradable.

ADDITIONAL ECOTOXICITY / ENVIRONMENTAL INFORMATION:

This pesticide is extremely toxic to fish and aquatic organisms.

SECTION 13. DISPOSAL CONSIDERATIONS**MATERIAL WASTE:**

Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations. Incineration is the preferred method of disposal, when appropriate. Operations that involve the crushing or shredding of waste materials or returned goods must be handled to meet the recommended exposure limit(s).

PACKAGING AND CONTAINERS:

Disposal must be in accordance with applicable federal, state/provincial, and/or local regulations.

SPECIAL ENVIRONMENTAL HANDLING PROCEDURES:

Do not allow product to reach ground water, water courses, sewage or drainage systems.

SECTION 14. TRANSPORT INFORMATION

Refer to site-specific procedures and requirements for additional guidance.

DOT CLASSIFICATION: Not regulated in containers less than or equal to 119 gallons (450 L).

IATA/ICAO CLASSIFICATION:

Proper Shipping Name:	Flammable liquids, n.o.s. (mineral oil, solvent naphtha petroleum)
Hazard Class:	3
UN Number:	UN 1993
Packing Group:	III

ADR CLASSIFICATION:

Proper Shipping Name:	Flammable liquids, n.o.s. (mineral oil, solvent naphtha petroleum)
Hazard Class:	3
UN Number:	UN 1993
Packing Group:	III

IMDG/IMO CLASSIFICATION:

Proper Shipping Name:	Flammable liquids, n.o.s. (mineral oil, solvent naphtha petroleum)
Hazard Class:	3
UN Number:	UN 1993
Packing Group:	III

SECTION 15. REGULATORY INFORMATION**WHMIS CLASSIFICATIONS:**

This product has been classified in accordance with the hazard criteria on the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations. The final packaged product is not subject to WHMIS classification. The following classification applies to the bulk formulation handled in the workplace.

Controlled Product Class:	B3: Combustible Liquid D2B: Toxic
---------------------------	--------------------------------------

**TSCA LISTING**

INGREDIENT	TSCA
------------	------

MSDS NAME: Ectiban EC Insecticide

MSDS NUMBER: SP000858

Latest Revision Date: 10-Oct-2011

Page 6 of 7

Light Mineral Oil	X
Solvent Naphtha (Petroleum), Light Aromatic	X
Cip Rinse Water	X

SECTION 16. OTHER INFORMATION

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequence of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

DEPARTMENT ISSUING MSDS:

Global Safety & the Environment
Merck & Co., Inc.
One Merck Drive
Whitehouse Station, NJ 08889

MERCK MSDS HELPLINE:

(800) 770-8878 (US and Canada)
(908) 473-3371 (Worldwide)
Monday to Friday, 9am to 5pm (US Eastern Time)

MSDS CREATION DATE:

14-Aug-1998

SUPERSEDES DATE:

21-Mar-2008

SECTIONS CHANGED (CAN SUBFORMAT):

1, 16

SIGNIFICANT CHANGES (CAN SUBFORMAT):

Phone Number(s), OEB