SAFETY DATA SHEETS

This SDS packet was issued with item:

078408700

N/A

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: **Dominator Insecticide Ear Tags**

SYNONYM(S): Dominator Ear Tags
Tomahawk Ear Tag

MSDS NUMBER: SP000853

EMERGENCY NUMBER(S): (908) 423-6000 (24/7/365) English Only

Transportation Emergencies - CHEMTREC:
(800) 424-9300 (Inside Continental USA)
(703) 527-3887 (Outside Continental USA)

Rocky Mountain Poison Center (For Human Exposure):
(303) 595-4869

Animal Health Technical Services:
For Animal Adverse Events: Small Animals and Horses: (800) 224-5318
For Animal Adverse Events: Livestock: (800) 211-3573
For Animal Adverse Events: Poultry: (800) 219-9286

INFORMATION: Animal Health Technical Services:
For Small Animals and Horses: (800) 224-5318
For Livestock: (800) 211-3573
For Poultry: (800) 219-9286

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

Flexible plastic ear tag
Yellow
Characteristic odor
Harmful if swallowed.
Harmful if absorbed through skin.
Irritating to skin.
Irritating to eyes.
May cause effects to:
central nervous system
cardiovascular system
liver
respiratory system
mucous membranes
May cause impaired fertility.
fetus
Toxic to fish and aquatic organisms.
May cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS:

The toxicological properties of the mixture(s) have not been fully characterized in humans or animals. However, there are data to describe the toxicological properties of the individual ingredients. The following summary is based upon available information about the individual ingredients of the mixture(s), or of the expected properties of the mixture(s).

The active ingredient, pirimiphos methyl, is an organophosphate cholinesterase inhibitor insecticide. Pirimiphos methyl is a skin and eye irritant. Overexposure to pirimiphos methyl may cause loss of appetite, headache, nausea, slurred speech, blurred vision, muscular weakness, and cold sweating. Adverse responses of cholinesterase inhibition in humans include vomiting, diarrhea, abdominal cramping, bronchospasm, pinpoint pupil, slow heart rate, excessive salivation and sweating, muscle fasciculation (twitching), tremors, weakness, increased or decreased blood pressure, agitation, seizures and coma. At low doses in humans, the only effect observed following pirimiphos methyl administration was a temporary decrease in plasma cholinesterase activity.

Di-2-ethylhexyl phthalate (DEHP) has low oral and dermal toxicity. Mucous membrane and eye irritation as well as central nervous system depression may occur. Dermal irritation is seldom seen. Skin sensitization has not been reported in humans.

LISTED CARCINOGENS

INGREDIENT	CAS NUMBER	OSHA	IARC	NTP	ACGIH
Titanium Dioxide	13463-67-7		2B		
Di(2-ethylhexyl)phthalate (DEHP)	117-81-7			R	A3

SECTION 3. COMPOSITION AND INFORMATION ON INGREDIENTS

PRODUCT USE: Veterinary product

CHEMICAL FORMULA: Pesticide impregnated ear tag

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
Titanium Dioxide	13463-67-7	<1
Pirimiphos Methyl	29232-93-7	20
Di(2-ethylhexyl)phthalate (DEHP)	117-81-7	20-30

ADDITIONAL INFORMATION: This MSDS is written to provide health and safety information for individuals who will be handling the final product formulation during research, manufacturing, and distribution. For health and safety information for individual ingredients used during manufacturing, refer to the appropriate MSDS for each ingredient. Refer to the package insert or product label for handling guidance for the consumer.

SECTION 4. FIRST AID MEASURES

NOTE: Persons attending to victim(s) should avoid direct contact with contaminated clothing or vomitus. Wear rubber gloves while washing material from skin and hair. Vinyl gloves provide no protection.

INHALATION: IMMEDIATELY remove all personnel from area of exposure and consult a physician or other qualified health care professional.

SKIN CONTACT: IMMEDIATELY remove from area of exposure. Carefully remove any contaminated clothing while wearing gloves to avoid secondary poisoning and wash skin thoroughly with soap and water. Consult a physician or other qualified health care professional if symptoms develop or persist.

EYE CONTACT: IMMEDIATELY remove from area of exposure. Flush eyes thoroughly with plenty of water. If wearing contact lenses, remove only after initial rinse, and continue rinsing eyes for at least 15 minutes. Consult a physician or other qualified health care professional if symptoms develop or persist.

INGESTION: IMMEDIATELY remove from area of exposure and consult a physician or other qualified health care professional.

NOTE TO PHYSICIAN: Acetylcholinesterase inhibitor. Organophosphate poisoning may result in 1) muscarinic (parasympathetic) symptoms including salivation, lacrimation, urination, defecation and sweating (SLUDS), 2) nicotinic or autonomic ganglia and somatic motor responses and 3) Central Nervous System (CNS) manifestations. Treat symptomatically and provide supportive care as necessary. Decontamination must proceed concurrently with treatment. Atropine and pralidoxime (2-PAM) may be antidotal, but are not always indicated depending on class of pesticide and amount of exposure, and may cause further toxicity. Follow current medical procedures for the proper treatment of pesticide poisonings.

SECTION 5. FIRE FIGHTING MEASURES

FLAMMABILITY DATA:

Flash Point: Not determined (liquids) or not applicable (solids).

SPECIAL FIRE FIGHTING PROCEDURES:
Wear full protective clothing and self-contained breathing apparatus (SCBA).

SUITABLE EXTINGUISHING MEDIA:
Carbon dioxide (CO2), extinguishing powder or water spray.

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 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 contact with eyes. Avoid contact with skin and clothing. 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. Store out of direct sunlight.

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

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

The following guidance applies to the handling of the active ingredient(s) in this formulation.

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)
Titanium Dioxide	13463-67-7	10 mg/m^3	15 mg/m^3
Di(2-ethylhexyl)phthalate (DEHP)	117-81-7	5 mg/m^3	5 mg/m^3

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

FORM: Flexible plastic ear tag
COLOR: Yellow
ODOR: Characteristic odor
SOLUBILITY:
Water: Insoluble

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

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.

HAZARDOUS DECOMPOSITION PRODUCTS / REACTIONS:
Hydrogen chloride (HCl). Carbon monoxide (CO). Carbon dioxide (CO2). Hydrocarbons

SECTION 11. TOXICOLOGICAL INFORMATION

The toxicological properties of this material have not been fully characterized in humans or animals. The information presented below pertains to the following individual ingredients of this material and not to the formulated product.

ACUTE TOXICITY DATA

INHALATION:
Pirimiphos methyl: Inhalation LC50: > 4.7 mg/L (rat)

Rats were exposed to DEHP aerosols for 6 hr/day, 5 days/week for 4 weeks at target concentrations of 0, 0.01, 0.05, and 1.0 mg/L. There was statistically significant increase in lung weights observed in males at the highest dosage, and this included foam cell proliferation and thickening of the alveolar septa.

SKIN:
Pirimiphos methyl: Dermal LD50: 2200-3500 mg/kg (rabbit).
Pirimiphos methyl was slightly to moderately irritating to the skin of rabbits.

DEHP is a weak skin irritant when administered topically or subcutaneously (0.2 mL of an emulsion of 100 g/L).

EYE:
Pirimiphos methyl was irritating to the eyes of rabbits.

DEHP produced no irritation when instilled undiluted into rabbit eyes

ORAL:
Pirimiphos methyl: Oral LD50: 2400-5976 mg/kg (rat)
In an acute neurotoxicity study with pirimiphos methyl, rats were dosed by gavage at levels ranging from 15 to 1500 mg/kg/day. Clinical signs included convulsions, at all dose levels, and behavioral abnormalities. Inhibition of plasma, red blood cell, or brain cholinesterase was measured at all dose levels [NOEL for neurotoxicity: < 15 mg/kg/day].

DEHP: Oral LD50 >25,000 mg/kg (rat).

DERMAL AND RESPIRATORY SENSITIZATION:
Pirimiphos methyl was not a skin sensitizer in guinea pigs.

DEHP was negative in human patch testing.

REPEAT DOSE TOXICITY DATA

SUBCHRONIC / CHRONIC TOXICITY:
In a 28-day feeding study, conducted in rats (5/sex/group), pirimiphos methyl was administered at dose levels of 0, 0.25, 0.40, 0.50, and 2.50 mg/kg/day. The LOEL was 2.5 mg/kg/day based upon the plasma cholinesterase inhibition observed in both male and female rats. In a 13-week oral study, pirimiphos methyl was administered to four groups of dogs (4/sex/dose) at dose levels as high as 25 mg/kg/day once daily. A reversible and non-progressive inhibition of plasma cholinesterase and dose-related inhibition in red blood cell cholinesterase levels were noted in both male and females at all dose levels (20% beginning in Week 1). No significant effects on brain cholinesterase levels were observed. However, the data are questionable because the post-mortem to assay time was not reported [LOEL for systemic toxicity: 2 mg/kg/day] [NOEL: < 2 mg/kg/day]. In a subchronic neurotoxicity study, male rats were dosed as high as 21 mg/kg/day and female rats were dosed as high as 25 mg/kg/day in their diets for 90 days. No neurotoxicity or systemic effects were noted.

In a chronic toxicity study, dogs were administered pirimiphos methyl at dose levels as high as 10 mg/kg/day for two years. Inhibition of plasma, red blood cell and brain cholinesterase was observed [LOEL for brain and plasma cholinesterase inhibition: less than or equal to 0.5 mg/kg/day; LOEL for red blood cell cholinesterase inhibition: 2 mg/kg/day] [NOEL for chronic toxicity: 0.5 mg/kg/day]. In a combined carcinogenicity/ chronic toxicity study, rats were administered 0.4 to 12.6 mg/kg/day of pirimiphos methyl for two years. Dose-related and progressive plasma and brain cholinesterase inhibition were seen at 2.1 and 12.6 mg/kg/day. Red blood cell cholinesterase was observed at 12.6 mg/kg/day at various time points. There were no effects on body weight, food consumption and hematology [NOEL for chronic toxicity: 12.6 mg/kg/day].

Di-2-ethylhexyl phthalate (DEHP) administered to dogs at 0.06 and 0.09 ml/kg/day in a one-year diet study resulted in fatty vacuolization and congested areas in the liver and cloudy swelling of kidney in the high dosage. Liver function tests were negative (No-observed-effect-level, NOEL: 0.06 ml/kg/day). In an oral gavage study, rats given 3.4 g/kg/day for up to 90 days caused the death of 15/20. No deaths in a 90-day rat diet study at 3% DEHP (1.9 g/kg body weight). In a 14-day dietary rat study, no mortality observed at <= 50 g/kg. Rats given dosages of DEHP of 164.8 mg/kg/day for 18-days resulted in a small but significant increase in liver weight and serum aspartate aminotransferase activity. No conclusive histopathological changes were observed.

REPRODUCTIVE / DEVELOPMENTAL TOXICITY:
Reproduction (two-generation male and female rats) and developmental (female rats and rabbits) oral studies were conducted with pirimiphos methyl. Dose levels in the rat reproduction study ranged from 0.87 mg/kg/day to 15.4 mg/kg/day. There were no clinical signs of toxicity in parental animals and no effect on reproductive parameters. Plasma cholinesterase was inhibited at dose levels of 3.43 mg/kg/day and higher. Dose levels in the rat and rabbit developmental studies ranged from 1.5 to 150 mg/kg/day and 12 to 48 mg/kg/day, respectively. Female rats were dosed during gestation days 7-16 while female rabbits were dosed during gestation days 6-18. No developmental effects were seen in rats up to 150 mg/kg/day. Maternal toxicity including abnormal gait, changes in behavior and respiration, incontinence and tremors were noted in dams. No significant toxicological effects were observed at 15 mg/kg/day. The only maternal toxicity in rabbits was inhibition of plasma, red blood cell, or brain cholinesterase. No developmental defects were seen in treated rabbits [NOEL for developmental toxicity: 48 mg/kg/day].

DEHP had embryo-lethal and teratogenic effects in rats at 5 or 10 g/kg via intra-peritoneal (IP) injection on day 5, 10 and 15 of gestation. The effects observed included: resorption, gross abnormalities, fetal death or decreased fetal size. Pregnant rats administered 2 and 4 ml/kg DEHP IP injections on days 3, 6 and 9 of gestation, implantation was prevented in 4/5 rats. Adverse effects on parturition included excessive bleeding, incomplete expulsion of fetuses and maternal deaths. DEHP produced lethal anti-fertility effects in mice after a single intra-peritoneal injection (12.8 ml/kg).

Rats given 28 g/kg of DEHP orally for 10 days resulted in seminiferous tubular atrophy, comprising a loss of spermatids and spermatocytes, in 4-wk-old rats. In 10-wk-old rats, about 50% of the tubules were atrophic. However, no testicular damage was detected in 15-wk-old rats. When DEHP was given to 4-wk-old rats in feed at 20 g/kg (approx 1.2 g/kg/day of body weight), the lesions produced were reversible.

In rats given 10 or 20 g/kg of DEHP in their diet, the testis atrophy was dose dependent after approx 2 weeks of feeding. This atrophy was accompanied by pituitary changes, enlargement and vacuolization of the basophils of the pars distalis, corresponding to the formation of castration cells seen after gonadectomy. In another study, there was a reduction in testicular and prostatic zinc levels concomitant with increased urinary excretion of zinc.

MUTAGENICITY / GENOTOXICITY:
Pirimiphos methyl was negative in an in vitro chromosome aberration assay in human lymphocytes, in an in vitro mouse lymphoma TK+/- forward gene mutation assay, and in an in vitro Salmonella typhimurium reverse gene mutation assay. In an in vivo bone marrow cytogenetic assay in CD-1 mice, pirimiphos methyl was negative at dose levels ranging from 24 mg/kg/day to 234 mg/kg/day. It was positive in an vitro sister chromatid exchange Chinese hamster lung fibroblasts assay.

DEHP exhibited no mutagenicity in Ames studies, in multiple strains, with or without S9 metabolic activation. In a mouse lymphoma study DEHP without S9, and two concentrations (7.5 and 20 mg/L) gave positive results. In a separate mouse lymphoma study, with and without S9, DEHP was found to be non-mutagenic.

CARCINOGENICITY:
Pirimiphos methyl was not carcinogenic in a combined carcinogenicity/chronic toxicity study conducted in rats or in carcinogenicity studies conducted in mice.

DEHP was carcinogenic in rats and mice when given dosages in diet of 6,000 or 12,000 ppm in rats and 3,000 or 6,000 ppm in mice for 103 week. DEHP caused an increased incidence of hepatocellular (liver cells) carcinomas female rats and male and female mice, and inducing an increased incidence of hepatocellular carcinomas or neoplastic nodules in male rats.

Two further studies confirmed the carcinogenicity of DEHP in rats. One study found a 78.5% incidence of hepatocellular carcinoma in 14 male rats fed a diet containing 20 g /kg for up to 108 week. Another study found either atocellular carcinomas or neoplastic nodules in 6/20 female rats given a diet containing 12 g/kg for 2 yr.

SECTION 12. ECOLOGICAL INFORMATION

There are no data for the final product or its formulation(s). The information presented below pertains to the following ingredient(s).

ECOTOXICITY DATA

INGREDIENT ECOTOXICITY

Pirimiphos methyl: 96-hr LC50 (rainbow trout): 404 mg/L
Pirimiphos methyl: 96-hr LC50 (bluegill sunfish): 2860 mg/L
Pirimiphos methyl: 24-hr LC50 (fathead minnow): 2.5 mg/L

ENVIRONMENTAL DATA

OTHER INGREDIENT ENVIRONMENTAL DATA: Pirimiphos methyl: log Kow (octanol/water partition coefficient): 4.12

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:
This product contains materials that are harmful to the environment. Do not allow product to reach ground water, water courses, sewage or drainage systems.

SECTION 14. TRANSPORT INFORMATION

This material is not subject to the transportation regulations of DOT, IATA, and the IMO.

ADR CLASSIFICATION:

Proper Shipping Name:	Environmentally hazardous substance, solid, n.o.s. (pirimiphos methyl)
Hazard Class:	9
UN Number:	UN 3077
Packing Group:	III
Classification Code:	M7

ADDITIONAL INFORMATION:
Although this material is regulated only under the ADR, both the IATA and IMO have special provisions that allow the shipper to transport materials under the shipping name "Environmentally hazardous substance, solid, n.o.s." if the material is being transported under both ADR and either IATA or IMO regulations.

SECTION 15. REGULATORY INFORMATION

TSCA LISTING

INGREDIENT	TSCA
Titanium Dioxide	X
Di(2-ethylhexyl)phthalate (DEHP)	X

U.S. STATE REGULATIONS

INGREDIENT	California Proposition 65	CARTK	NJRTK	CTRTK	MARTK
Titanium Dioxide			1861		X
Pirimiphos Methyl			3430		
Di(2-ethylhexyl)phthalate (DEHP)	C D R - M	X	0238		X

INGREDIENT	PARTK	MNRTK	MIRTK	RIRTK
Titanium Dioxide	X	X		X
Di(2-ethylhexyl)phthalate (DEHP)	X	X		X

Fields in the above tables that do not contain data indicate that those materials have not been listed by local regulations.

"WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm."

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)
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