MATERIAL SAFETY DATA SHEET

ORTHENE® Tree and Ornamental Spray

Please read the entire document. This Material Safety Data Sheet contains important environmental, health and toxicology information for your employees, and anyone who will use, transport, store, dispose of or handle this product. Please make sure this information is given to them. It also contains information to help you meet community right-to-know/emergency response reporting requirements under WHMIS. If you resell this product, this MSDS must be given to the buyer or the information contained herein must be incorporated in your MSDS.

Last updated on: February 26, 2002

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ORTHENE® Tree and Ornamental Spray-Canada
PRODUCT NUMBERS: PMRA REGISTRATION NUMBER: 15,559
SYNONYM(S):

MANUFACTURER
Arvesta Corporation
100 First Street, Suite 1700
San Francisco, CA USA 94105

EMERGENCY TELEPHONE NUMBERS
HEALTH EMERGENCY (24 hr):
1-800-228-5635 ext. 174 or
1-612-221-3999 ext. 174
SPILL (24 hr): CHEMTREC: 1-800-424-9300

SECTION 2: CONFIRMATION / INFORMATION ON INGREDIENTS

PRODUCT NAME	CAS #	EXPOSURE LIMITS	WEIGHT PERCENT
Active Ingredient: Acephate: O, S-Dimethyl: Acetylphosphoramidothioate	30560-19-1	NA	75
Inert Ingredients* Synthetic Amerphous Silica	11292008	10 mg/m^3 ACGH TLV 6 mg/m3 OSHA TWA	25

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* Inert ingredients are any substance other than an active ingredient contained in this product. Only those inert ingredients considered hazardous are listed. The identity of any other substances are withheld because they are considered trade secrets. Specific information on the inert ingredients for the management of exposures, spills, or safety assessments can be obtained by the treating physician or nurse by calling 1-800-228-5635 Ext. 174 or 1-612-221-3999 Ext. 174.
TLV - Threshold Limit Value TWA - Time Weighted Average
STEL - Short-term Exposure Limit CAS - Chemical Abstract Service Number

SECTION 3: HAZARDS IDENTIFICATION
EMERGENCY OVERVIEW
CAUTION:
- CAUSES EYE IRRITATION
- HARMFUL IF SWALLOWED
- AVOID CONTACT WITH EYES, SKIN OR CLOTHING
- AVOID BREATHING DUST OR SPRAY MIST
- KEEP OUT OF REACH OF CHILDREN

POTENTIAL HEALTH EFFECTS

Acute Toxicity (Primary Routes of Exposure)

Signs and Symptoms of Poisoning: This product contains a cholinesterase inhibitor. Signs and symptoms that may be seen, usually within several hours of exposure, include but are not limited to, headaches, dizziness, weakness, constriction of pupil, blurred or dark vision, excessive salivation or nasal discharge, profuse sweating, abdominal cramps, nausea, diarrhea and vomiting. Severe poisonings may result in incontinence, unconsciousness, convulsion and death.

Eye: This product is slightly irritating to the eyes and could cause prolonged (days) impairment of your vision. The degree of the injury will depend on the amount and duration of the contact and the speed and thoroughness of the first aid treatment. The expected adverse effects resulting from an exposure may include redness and possibly some minor swelling. May produce systemic toxicity by absorption through eyes.

Skin: Based on an evaluation of the ingredients and/or similar products, this product is expected to cause brief and/or minor skin irritation. The degree of injury will depend on the amount and duration's of the contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects may include redness and possibly some minor swelling.
Based on an evaluation of the ingredients and/or similar products, this product is expected to be minimally toxic when absorbed through the skin. The degree of injury will depend on the amount of material absorbed and the speed and thoroughness of the first aid treatment. The expected adverse systemic heals effects resulting from an exposure and described above.

Ingestion: Based on an evaluation of the ingredients and/or similar products, this product is expected to be slightly toxic when ingested. The degree of injury will depend on the amount of material ingested and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects resulting from an exposure are described above.

Inhalation: Based on an evaluation of the ingredients and/or similar products, this product is expected to be minimally toxic when inhaled. The degree of injury will depend on the amount of material inhaled and the speed and thoroughness of the first aid treatment. The expected adverse systemic health effects are described above.

Chronic Toxicity (Including Cancer): High doses of Acephate Technical have produced cancer in mice, but there is no evidence that Acephate causes cancer in humans.

Teratology (Birth Defects) Information: There is no evidence that Acephate causes birth defects.

Reproduction Information: There is no evidence that Acephate causes reproductive effects in humans.

For complete discussion of the toxicology data from which this evaluation was made, refer to Section 11.

SECTION 4: FIRST AID MEASURES
EMERGENCY NUMBER: 1-800-228-5635 Ext. 174 or 1-612-221-3999 Ext. 174
EYES: Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. Remove contact lenses if worn. No additional first aid should be necessary. However, if irritation persists, see a doctor.

SKIN: No first aid procedures are required. As a precaution, wash skin thoroughly with plenty of soap and water. Remove and wash contaminated clothing before reuse.

INGESTION: If swallowed, drink 1 to 2 glasses of water and induce vomiting by touching the back of the throat with finger. If possible, contact a physician, Poison Control Center, or emergency center before inducing vomiting. Do not induce vomiting or give anything by mouth to an unconscious person. Take person and product container to the nearest emergency treatment center.

INHALATION: If inhaled, move victim to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. Get medical attention.

NOTES TO PHYSICIAN: This material contains a cholinesterase inhibitor. Measurement of blood cholinesterase activity may be useful in monitoring exposure but decisions regarding treatment will usually need to be made before test results are available. If signs of cholinesterase inhibition appear, atropine sulfate is antidotal. 2-PAM (PROTOPAM) is also antidotal and may be used in conjunction with atropine but should not be used alone.

SECTION 5: FIRE FIGHTING MEASURES
FLASH POINT: NA Method: NA
AUTOIGNITION: NDA
EXTINGUISHING MEDIA: CO2, dry chemical, foam, water fog.
FLAMMABLE LIMITS (% by volume in air): Lower: NDA Upper: NDA
NFPA RATINGS: Health 1; Flammability 1; Reactivity NDA; Special; NDA
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association, NFPA.

FIRE FIGHTING INSTRUCTIONS: Products of combustion from fires involving this material may be toxic. Avoid breathing smoke and mists. Avoid personnel and equipment contact with fallout and runoff. Minimize the amount of water used for fire fighting. Do not enter any enclosed area without full protective equipment, including self-contained breathing equipment. Contain and isolate runoff and debris for proper disposal. Decontaminate personal protective equipment and fire fighting equipment before reuse. Read the entire document.

HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur, nitrogen and phosphorous. Incomplete combustion can produce carbon monoxide.

SECTION 6: ACCIDENTAL RELEASE MEASURES
EMERGENCY PHONE NUMBER: 1-800-228-5635 Ext. 174 or 1-612-221-3999 Ext. 174
OBSERVE PRECAUTIONS IN SECTION 8: PERSONAL PROTECTION
Stop the source of the spill if safe to do so. Contain the spill to prevent further contamination of the soil, surface water, or ground water.

FOR SPILLS ON LAND:

CONTAINMENT: Reduce airborne dust. Avoid runoff into storm sewers or other bodies of water.

CLEANUP: Clean up spill immediately. Vacuum or sweep up material and place a disposable container. Wash area with soap and water. Pick up wash liquid with an additional absorbent and place in a disposable container.

FOR SPILL ON WATER:

CONTAINMENT: This material will quickly dissolve in water. Stop the source of the release. Contain and isolate to prevent further release into soil, surface water and ground water. Notify and consult with appropriate regulatory authorities.

CLEANUP: Clean up spill immediately. Absorb spill with inert material. Vacuum or sweep up and place into a disposable container. For further information, call 1-800-228-5635 Ext. 174 or 1-612-221-3999 Ext. 174

DISPOSAL METHODS: Refer to Section 13, Disposal Considerations

SECTION 7: HANDLING AND STORAGE
It is a violation of federal law to use this product in a manner inconsistent with its labeling. Read entire label. Use strictly in accordance with label precautionary statements and directions.

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL.

Keep pesticide in original container
Store in a cool, dry place. Protect from excessive heat or direct sunlight.
Do not contaminate food or foodstuffs.
Do not store or transport near feed or food.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION
EYE PROTECTION: Do not get this material in your eyes. Eye contact can be avoided by wearing chemical goggles.

RESPIRATORY/VENTILATION REQUIREMENTS: Wear approved pesticide respiratory protection when working with this material unless ventilation is adequate to keep airborne concentrations below recommended exposure standards.
Use adequate ventilation to keep the airborne concentrations of this material below the recommended exposure standards.

SKIN PROTECTION: No special skin protection is usually necessary. Avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing protective clothing.

EXPOSURE LIMITS: See Section 2.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White powder with a strong cabbage-like odor	**Dissociation Constant:**	NDA
Melting Point:	NA	**Octanol/Water Partition Coefficient:**	NDA
Boiling Point:	NA	**pH:**	5.0 (1% or 5% aq.)
Density/Bulk Density:	27.38 lbs/cu. ft.	**Viscosity:**	NDA
Specific Gravity:	NDA	**Miscibility:**	NDA

Solubility:	Soluble in water; moderately soluble in alcohol and acetone. Slightly soluble in aromatic solvents.	**Corrosion Characteristics:**	Not corrosive to packaging material.
Vapor Pressure:	Non volatile		

SECTION 10: STABILITY AND REACTIVITY
CHEMICAL STABILITY : Stable at room temperatures below 180° F (82° C)
INCOMPATIBILITY : Avoid contact with alkaline materials.

HAZARDOUS DECOMPOSITION
PRODUCTS : Contact with alkaline materials including hypochlorite may product noxious gases.
HAZARDOUS POLYMERIZATION : Polymerization will not occur.
IMPACT EXPLODABILITY : NDA
OXIDATION/REDUCTION
PROPERTIES : NDA

SECTION 11: TOXICOLOGICAL INFORMATION
ACUTE (Product Specific Information)

Eye Irritation: Minimal irritation clearing within 7 days.

Skin Irritation: No irritation at 72 hours after exposure.

Dermal Toxicity: The dermal LD50 of Acephate in rabbits was >10 g/kg

Oral Toxicity: The oral LD50 in male rats was 1434 mg/kg

Inhalation Toxicity: The 1-hour LC50 in rats is > 12.1 mg/l.

Skin Sensitization: No product toxicity data available. The hazard evaluation was based on data on the components. The active ingredient, Acephate, did not induce a positive skin sensitization reaction in the guinea pig using the Modified Buehler or the Maximization techniques.

SUBCHRONIC: The most significant treatment related effect of Acephate is a decrease in cholinesterase activity of plasma, RBC, and brain.

CHRONIC/CARCINOGENICITY: When mice were fed diets containing Acephate throughout their entire lifetime, a compound-related increase in liver weight, together with liver carcinoma (a commonly occurring cancer in mice) occurred in high dose-females. These changes were not observed in the males at any dose level or in low- or mid-dose females. When rats were fed diets containing Acephate throughout their entire lifetime, there was no treatment related increase in tumors at any site. The most significant treatment-related effect was a decrease in cholinesterase activity of plasma, RBC and brain.

TERATOLOGY/DEVELOPMENTAL TOXICITY: There is no evidence that Acephate causes birth defects.

REPRODUCTION: When male and female rats were fed Acephate continuously for two generations through weaning of the third generation, animals in the mid- and high-dose groups demonstrated compound-related effects on reproductive performance. The low-dose was judged to be a no-effect level.

MUTAGENICITY: Acephate has been shown to have a weak potential to cause mutation when tested in microbes or cultured cells and in some studies using mice. However, the results of most live animal studies indicate that Acephate does not cause mutations in whole animals.
OTHER: The significance of the above-mentioned results cannot be fully evaluated for humans. However, based on the dose-response observed in these studies and risk evaluation of the results, it is concluded that the risk of developing cancer or other adverse health effects is minimal if one follows the precautions outlined on the product label, material safety data sheet and any plant safety instructions.

SECTION 12: ECOLOGICAL INFORMATION
AVIAN TOXICITY: Acephate is moderately toxic to birds.

Mallard Duck Oral LD50: 350 mg/kg

Pheasant Oral LD50: 140 mg/kg

Chickens Oral LD50: 852 mg/kg

In addition, Acephate in the diet causes adverse effects on reproduction in mallard ducks (no-effect level greater than 5 ppm, but less than 20 ppm) and in bobwhite quail (no-effect level greater than 20 ppm, but less than 80 ppm).

AQUATIC ORGANISM TOXICITY: Acephate is practically non-toxic to freshwater fish. The 96-hour LC50 for ORTHENE Technical was found to be higher than 1,000 ppm in rainbow trout, bluegill, and channel catfish. The following LC50 values for ORTHENE 75 S Soluble Powder substantiate the low toxicity to fish:

Bluegill: 1,725 ppm
Black Bass:
Catfish: 2,230 ppm
Mosquito Fish: 9,550 ppm
Goldfish: 750 ppm
Crayfish:

OTHER NON-TARGET ORGANISM TOXICITY: Acephate is highly toxic to bees. The acute oral LD50 is 1.2 ug/bee.

SECTION 13: DISPOSAL CONSIDERATIONS

END USERS MUST DISPOSE OF ANY UNUSED PRODUCT AS PER THE LABEL RECOMMENDATIONS.
DISPOSAL METHODS: Check governmental regulations and local authorities for approved disposal of this material. Dispose in accordance with applicable laws and regulations.

SECTION 14: TRANSPORT INFORMATION
D.O.T. SHIPPING NAME: Pesticides (Non-regulated)
TECHNICAL SHIPPING NAME: Acephate
D.O.T. HAZARD CLASS: NA
U.N/N.A. NUMBER: Does not apply
PRODUCT RQ (lbs): NONE
D.O.T. LABEL: NONE
D.O.T. PLACARD: NONE

SECTION 15: REGULATORY INFORMATION
This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

SECTION 16: OTHER INFORMATION
REASON FOR ISSUE: New MSDS for Canada
PREPARED BY: James Reilly
APPROVAL DATE: November 24, 1998
SUPERSEDES DATE: NA
MSDS NUMBER: A-004 (Canada)

The information in this MSDS is based on data available to us as of the revision data given herein, and believed to be correct. Contact Tomen's Compliance Officer, Safety, Health & Environmental Affairs at (415) 536-3491 to determine if additional data and information have become available since the revision date.
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Always read and follow label directions.