# MATERIAL SAFETY DATA SHEET

**Univar USA Inc.**
11305 Four Points Drive
Bldg. 1, Suite 210
Austin, Texas 78726

**Emergency Response Telephone Numbers**

| | |
|---|---|
| For Spills Call: | 1-(800)-424-9300 |
| For Medical Emergencies Call: | 1-(866)-674-4334 |
| For Other Emergencies Call: | 1-(952)-653-3523 |

## I. Material Identification

Product Name: **MasterLine Kontrol 4 – 4 for Mosquitoes, Flies & Gnats**
EPA Reg. No: 73748-4

| **INGREDIENTS:** | **(% w/w)** |
|---|---|
| Permethrin (CAS Reg. No. 52645-53-1)<br>(3-phenoxyphenyl) methyl (±) cis, trans-3-(2,2-dichloroethenyl)<br>-2,2-dimethylcyclopropane carboxylate [1] | 4.6% |
| Piperonyl Butoxide (CAS Reg. No. 51-03-6)<br>Equivalent to 80% (butylcarbityl)(6-propylpiperonyl) ether<br>And 20% related compounds | 4.6% |
| Inert Ingredients [2] | 90.8% |

[1] *cis/trans* ratio: minimum 35% (±) *cis* and maximum 65% *trans*

[2] Petroleum distillate solvent (CAS No. 64741-89-5).

Chemical Class: Synthetic Pyrethroid Insecticide and Synergist

EPA Signal Word: Caution

## II. Hazardous Ingredients

| **MATERIAL:** | | **OSHA PEL** | **ACGIH TLV** |
|---|---|---|---|
| Active Ingredients: | Permethrin | Not established | Not established |
| | Piperonyl Butoxide | Not established | Not established |
| Inert Ingredient: | Petroleum Distillate | 5 mg/m$^3$ (oil mist) | 5 mg/m$^3$ (oil mist) |

## III. Health Hazard Data

**EYE:** May cause eye irritation, but does not cause irreversible damage to eye tissue.

**SKIN CONTACT:** May cause moderate skin irritation with prolonged or repeated contact. In rare instances, exposure to this product may cause numbing, burning and tingling sensations. These effects are reversible and usually subside within 12 hours.

**SKIN ABSORPTION:** The acute dermal toxicity is considered to be low. The dermal $LD_{50}$ for rabbits is greater than 2000 mg/kg.

**INGESTION:** The acute oral toxicity is considered to be low. The oral $LD_{50}$ for rats is greater than 5000 mg/kg. Small amounts that might be swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death. If aspirated (liquid enters the lungs), may cause lung damage or even death due to chemical pneumonia.

**INHALATION:** The acute inhalation toxicity is considered to be low. The inhalation $LC_{50}$ for rats is greater than 4 mg/l for 4 hours. Symptoms of excessive exposure includes squinting eyes, irregular and rattled breathing, ataxia, headache, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects.

**SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:** Excessive exposure may produce effects on the nervous system such as sensitivity to touch and sound, tremors, abnormal movement, and clonic convulsions. Long-term studies with permethrin in laboratory animal resulted in increased liver and kidney weights, induction of the liver microsomal drug metabolizing enzyme system, and histopathological changes in the lungs and liver. Long-term studies with piperonyl butoxide indicated increased organ weights in the liver, kidney, and adrenal glands.

**CANCER INFORMATION:** Chronic feeding studies with permethrin in mice and rats indicate limited evidence of oncogenicity in laboratory animals. Based on comprehensive evaluations of all relevant health effects data, it was concluded that the oncogenic potential in humans is extremely weak or nonexistent. A chronic feeding study in mice indicate an increased incidence of benign liver tumors; the significance of these findings is questionable and under review. The doses that produced this oncogenic effect in laboratory animals, greatly exceeds human exposure levels for the recommended use of this product.

**TERATOLOGY (BIRTH DEFECTS):** The active ingredients in this product did not cause birth defects in laboratory animal studies. Exposures having no effect on the mothers had no effect on the fetuses in rabbits and rats. The no-effect levels for permethrin in rabbits and rats were 600 mg/kg and 50 mg/kg, respectively. The no-effect levels for piperonyl butoxide in rabbits and rats were 200 mg/kg and 1000 mg/kg, respectively.

**REPRODUCTIVE EFFECTS:** Permethrin and piperonyl butoxide did not interfere with fertility in animal reproduction studies. The no effect level for permethrin in a two-generation rat reproduction study was 180 mg/kg. The no-effect level for piperonyl butoxide in a two-generation rat reproduction study was 350 mg/kg.

**MUTAGENICITY (EFFECTS ON GENETIC MATERIAL):** Based on a number of *in vivo* and *in vitro* studies, it was concluded that the active ingredients in this product are not mutagenic.

## IV. First Aid Procedures

**EYES:** Hold eye open and rinse slowly and gently with water for 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

**INGESTION:** Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.

**INHALATION:** Remove person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further advice.

**NOTE TO PHYSICIAN:** This product has low oral, dermal, and inhalation toxicity. It is moderately irritating to the skin and is may be irritating to the eyes. Reversible skin sensations (paresthesia) may occur and skin salves have been found useful in reducing discomfort. Contains a petroleum distillate solvent that can produce a severe pneumonitis or fatal pulmonary edema if aspirated during vomiting. Consideration should be given to gastric lavage with an endotracheal tube in place. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

## V. Physical Hazard Information

**CHEMICAL & PHYSICAL PROPERTIES:**

| | |
|---|---|
| Color: | Light yellow |
| Physical State: | Liquid |
| Odor: | Slight odor of petroleum oil |
| Density: | 7.27 lbs/gal (0.87 gm/cm$^3$) |
| Solubility: | Does not disperse in water |

| | |
|---|---|
| Viscosity: | 60 cps |
| pH: | Not applicable - does not disperse with water |
| Stability: | Stable |

**FIRE AND EXPLOSION HAZARDS:**

| | |
|---|---|
| Flash Point: | > 200° F (93° C) |
| Method Used: | TCC |
| Extinguishing Media: | Foam, $CO_2$, or dry chemical is preferred. Soft stream water fog only if necessary |
| Fire & Explosion Precautions: | Foam fire-extinguishing system is preferred because uncontrolled water can spread possible contamination. Do not allow fire-fighting water to escape into waterways or sewers. Toxic irritating gases can be formed. |
| Fire-Fighting Equipment: | Use positive-pressure self-contained breathing apparatus and full protective equipment. |

**REACTIVITY:**

| | |
|---|---|
| Stability: | (CONDITIONS TO AVOID) Avoid heating above 200° F (93° C). Contains a petroleum distillate solvent which can burn. |
| Incompatibility: | (SPECIFIC MATERIALS TO AVOID) Strong Oxidizers. |
| Hazardous Decomposition: | Under fire conditions hydrogen chloride, oxides of chlorine, carbon dioxide, carbon monoxide, and asphyxiants can be formed. |
| Hazardous Polymerization: | Will not occur. |

## VI. Environmental Protection

**IN CASE OF SPILLS OR LEAKS:** Wear protective clothing as described in Section VII (Personal Protection and Precautions) of this MSDS. Absorb liquid with material such as clay, sand, sawdust, or dirt. Sweep up and place in a suitable container for disposal and label the contents. Area can be washed down with a suitable solution of bleach or soda ash and an appropriate alcohol (methanol, ethanol, or isopropanol). Follow this by washing with a strong soap and water solution. Absorb any excess liquid as indicated above, and add to the disposal container. Keep product, contaminated materials and wash water out of streams and sewers. Wash exposed body areas thoroughly after handling.

**DISPOSAL METHOD:** Do not contaminate food, feed, or water by storage or cleaning of equipment. Wastes resulting from the use of this product may be disposed of on site, if approved waste handling facilities are available, or at an approved waste handling facility.

**PHYSICAL ENVIRONMENTAL PROPERTIES:** In soil, permethrin is stable over a wide range of pH values. Due to its high affinity for organic matter, ($K_{oc}$ = 86,000), there is little potential for movement in soil or entry into ground water. Permethrin has a Log $P_{OW}$ of 6.1, but a low potential to bioconcentrate (BCF = 500) due to the ease with which it is metabolized. Piperonyl butoxide is reported to have a maximum half-life of 4.3 days in soil and from 0.55 to 1.64 days in aqueous environments. Gravitational settling remove piperonyl butoxide released in the atmosphere as an aerosol. Gaseous piperonyl butoxide degrades in the atmosphere with an estimated half-life of 3.4 hours. It is reported that piperonyl butoxide has a low potential for environmental bioconcentration.

**ENVIRONMENTAL TOXICOLOGY:** Permethrin is highly toxic to fish ($LC_{50}$ = 0.5 $\mu$g/L to 315 $\mu$g/L) and aquatic invertebrates ($LC_{50}$ = 0.02 $\mu$g/L to 7.6 $\mu$g/L). Marine species are often more sensitive than the freshwater species. Bacteria, algae, mollusks, and amphibians are much more tolerant of permethrin than the fish and arthropods. Care should be taken to avoid contamination of the aquatic environment. Permethrin is slightly toxic to birds and oral $LD_{50}$ values are greater than 3,600 mg/kg. Longer dietary studies showed that concentrations of up to 500 ppm in the diet had no effect on bird reproduction. Piperonyl butoxide is acutely toxic to fish ($LC_{50}$ = 3.94 mg/L to 6.12 mg/L) and highly toxic to aquatic invertebrates ($LC_{50}$ 0.23 mg/L to 0.51 mg/L). Care should be taken to avoid contamination of aquatic environments. Piperonyl butoxide has a low to very low toxicity to birds with an acute oral $LD_{50}$ greater than 2,250 mg/kg and longer-term dietary studies at $LC_{50}$ values greater than 5,620 ppm.

## VII. Personal Protection and Precautions

**EXPOSURE GUIDELINE(S):**

| | |
|---|---|
| Permethrin | None established. |
| Piperonyl Butoxide | None established |
| Petroleum Distillate | 5 mg/m$^3$ (oil mist). |

**VENTILATION:** Provide general and/or local exhaust ventilation to control airborne levels below the exposure guideline. Ventilate all transport vehicles prior to unloading.

**RESPIRATORY PROTECTION:** Atmospheric levels should be maintained below the exposure guideline. For most conditions, no respiratory protection should be needed; however, if the exposure guideline is exceeded, use an air-purifying respirator approved for pesticides (U.S. NIOSH/MSHA, EU CEN, or comparable certification organization).

**EYE/FACE PROTECTION:** Use chemical protective goggles or a face shield.

**SKIN PROTECTION:** Wear coveralls or long-sleeved shirt and long pants, chemical protective gloves (nitrile, neoprene, or Viton® brand), head covering and shoes plus socks. For increased exposures, wear a full body cover barrier suit, such as a PVC rain suit. Contaminated leather articles, such as shoes, belts, and watchbands, should be removed and destroyed. Launder all work clothing before reuse. Keep work clothing separated from household laundry.

**SPECIAL PRECAUTIONS FOR HANDLING AND STORAGE:** See product label. Harmful if swallowed, inhaled, or absorbed through the skin. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating or smoking. Avoid breathing dust vapor, or spray mist. Store in a cool, dry place and away from heat. Keep out of reach of children and animals. Keep away from food, feedstuffs, and water supplies.

## VIII. DOT Hazardous Materials Information

**U.S. SURFACE FREIGHT CLASS:** Insecticide, NOI, other than Poison. NMFC Item 102120.

**MARINE POLLUTANT #1:** permethrin (Severe Marine Pollutant).

**OTHER SHIPPING INFORMATION:** This product is not regulated for transport in the USA when shipped via highway or railroad in non-bulk packages. Describe using the "U.S. Surface Freight Class" above, which applies in all cases.

* * * * *

**SPECIAL NOTE:** The following applies to water and air shipments, and shipments in bulk packages:

**PROPER SHIPPING NAME:** Environmentally hazardous substance, liquid, n.o.s. (permethrin)

**HAZARD CLASS OR DIVISION:** 9

**IDENTIFICATION NUMBER:** UN 3082

**PACKING GROUP:** III

**OTHER:** NAERG Guide 171

## IX. Regulatory Information

**SARA 313 INFORMATION:** This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

| CHEMICAL NAME | CAS NUMBER | CONCENTRATION |
|---|---|---|
| Permethrin | 52645-53-1 | 4.6% |
| Piperonyl Butoxide | 51-03-5 | 4.6% |

**SARA HAZARD CATEGORY:** This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard

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**TOXIC SUBSTANCES CONTROL ACT (TSCA):** All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

**OSHA HAZARD COMMUNICATION STANDARD:** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:**

| Category | Rating |
|---|---|
| Health | 1 |
| Flammability | 1 |
| Reactivity | 0 |

**COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):** This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA which may require reporting of releases:

Category:

| Chemical Name | CAS Number | RQ | % in Product |
|---|---|---|---|
| Permethrin | 52645-53-1 | not listed | 4.6% |
| Piperonyl Butoxide | 51-03-6 | not listed | 4.6% |
| Petroleum Distillate | 64741-89-5 | not listed | 90.8% |

| | |
|---|---|
| Issue Date: | June 24, 2003 |
| Revision Date: | August 27, 2008 |
| | May 8, 2009 |
| | October 11, 2012 |
| | October 30, 2013 |

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not "Hazardous" per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, expressed or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state, and local laws and regulations. See MSDS for health and safety information.

MasterLine®

By Univar

# KONTROL 4 – 4

## For Mosquitoes, Flies and Gnats

A Quick Knockdown, Low Odor, Non-Corrosive Synergized Synthetic Pyrethroid
for the Control of Adult Mosquitoes in Residential, Recreational, and Other Areas.
Also for Use Against Biting and Non-Biting Midge and Black Flies

For use only by federal, state, tribal, or local governmental officials responsible for public health or vector control, or by persons certified in the appropriate category or otherwise authorized by the state or tribal lead pesticide regulatory agency to perform adult mosquito control applications, or by persons under their direct supervision.

**ACTIVE INGREDIENTS:**

| | |
|---|---|
| ***Permethrin** | 4.6% |
| ****Piperonyl Butoxide** | 4.6% |
| **OTHER INGREDIENTS:** | 90.8% |
| Contains Petroleum Distillate | |
| **TOTAL** | 100.0% |

*(3-phenoxyphenyl)methyl(+/-)*Cis/trans* 3-(2,2-dichloroethenyl)2,2-Dimethyl cyclopropanecarboxylate
*Cis/trans* ratio: min. 35% (+/-) *cis* and max. 65% (+/-) *trans*
**(butylcarbityl)(6-propylpiperonyl) ether and related compounds
Contains 0.3344 pounds of Permethrin and 0.3344 pounds of Piperonyl Butoxide per gallon.

**EPA Registration No. 73748-4**

## KEEP OUT OF REACH OF CHILDREN

# CAUTION

*See Inside Attached Booklet For Additional Precautionary Statements.*

**"PRECAUCION AL USUARIO**: Si usted no lee ingles, no use este producto hasta que la etiqueta haya sido explicado ampliamente"

**Univar Environmental Sciences**
11305 Four Points Drive
Building 1, Suite 210
Austin, Texas 78726

| First Aid | |
|---|---|
| **If in Eyes:** | Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice. |
| **If on Skin or Clothing:** | Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 – 20 minutes. Call a poison control center or doctor for treatment advice. |
| **If Swallowed:** | Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person. |
| **If Inhaled:** | Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further advice. |
| **HOTLINE NUMBER** | |
| Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For additional information on this pesticide product (including health concerns, medical emergencies, or pesticide concerns), you may call 1-800-222-1222, twenty-four (24) hours a day, seven (7) days per week. | |
| **Note to Physician:** Contains petroleum distillate – vomiting may cause aspiration pneumonia. | |

## PRECAUTIONARY STATEMENTS
## HAZARDS TO DOMESTIC ANIMALS AND HUMANS

Contains Petroleum Distillate. Causes moderate eye irritation. Avoid contact with eyes or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Wear long-sleeved shirt and long pants, socks and shoes, and chemical-resistant gloves (such as barrier laminate, nitrile rubber, neoprene rubber, or viton). Remove contaminated clothing and wash before reuse.

### Personal Protective Equipment (PPE)

Some materials that are chemical-resistant to this product are barrier laminate, nitrile rubber greater or equal to 14 mils or neoprene rubber greater or equal to 14 mils. If you want more options, follow the instructions for category E on an EPA chemical-resistance category selection chart.

**Mixers, loaders, applicators, and other handlers must wear:** Long-sleeve shirt; Long pants; Shoes and socks; Chemical-resistant gloves for all handlers except for applicators using motorized ground equipment, pilots and flaggers; and Chemical-resistant apron for mixers/loaders, persons cleaning equipment, and persons exposed to the concentrate.

See engineering controls for additional information.

### User Safety Requirements:

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

### User Safety Recommendations:

- Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### Engineering Controls

Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticide [40 CFR §170.240(d)(6)].

Human flagging is prohibited. Flagging to support aerial application is limited to use of the Global Positioning System (GPS) or mechanical flaggers.

## ENVIRONMENTAL HAZARDS

This pesticide is extremely toxic to aquatic organisms, including fish and aquatic invertebrates. To protect the environment, do not allow pesticide to enter or run-off into storm drains, drainage ditches, gutters, or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Rinsing application equipment over the treated area will help avoid run-off to water bodies or drainage systems.

This pesticide is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift on blooming crops or weeds while bees are actively visiting the treatment areas.

## ENVIRONMENTAL HAZARDS FOR WIDE AREA MOSQUITO ADULTICIDE APPLICATIONS

This pesticide is extremely toxic to aquatic organisms, including fish and aquatic invertebrates. Run-off from treated areas or deposition of spray droplets into a body of water may be hazardous to fish and aquatic invertebrates.

When applying as a wide area mosquito adulticide, before making the first application in a season, it is advisable to consult with the state or tribal agency with primary responsibility for pesticide regulation to determine if other regulatory requirements exist.

When applying as a wide area mosquito adulticide, do not apply over bodies of water (lakes, rivers, permanent streams, natural ponds, commercial fish ponds, swamps, marshes or estuaries), except when necessary to target areas where adult mosquitoes are present, and weather conditions will facilitate movement of applied material away from the water in order to minimize incidental deposition into the water body.

## PHYSICAL AND CHEMICAL HAZARDS

Do not use, pour, spill or store near heat or open flame.

## DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

**Use Restrictions:**

- Apply this product only as specified on this label.
- Do not contaminate food or feedstuffs.
- Application of this product using hand-held cold or thermal fogging equipment is prohibited.
- This product is not for use in outdoor residential misting systems (indoor and outdoor) and metered release misting devices.
- Do not apply as a broadcast or spot treatment to indoor surfaces at residential sites, including nurseries, day-care centers, schools, hospitals, and nursing homes.
- Except when applying for mosquito control, do not enter or allow others to enter treated area until sprays have dried.
- Except when applying for mosquito control, do not enter or allow others to enter until vapors, mists, and aerosols have dispersed, and the treated area has been thoroughly ventilated.
- Except when applying for mosquito control, do not apply this product in a way that will contact workers or other persons, either directly or through drift.
- Application of this product is prohibited directly into sewers or drains, or to any area like a gutter where drainage to storm sewers, storm drains, water bodies, or aquatic habitat can occur. Do not allow this product to enter any drain during or after application.
- Remove pets, birds, and cover fish aquariums and ornamental fish ponds before spraying, and turn aquarium systems off prior to use.
- Except when applying for mosquito control, only protected handlers may be in the area during application.
- **Aerial application of this product is prohibited in the State of Florida unless specifically authorized by the Bureau of Entomology and Pest Control, Florida Department of Agriculture and Consumer Services.**

### NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protections Standards for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries and greenhouses.

Keep unprotected persons out of treated areas until sprays have dried. Wear protective clothing when using or handling this product to help avoid exposure to eyes and skin. Eye protection, gloves, a long-sleeved shirt and long pants are recommended.

Allow spray to dry before allowing adults, children or pets on treated areas.

For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

## CONDITIONS AND RATES TO USE FOR MOSQUITO CONTROL

**KONTROL 4 - 4** may be applied either diluted or undiluted as a non-thermal fog.

**KONTROL 4 - 4** is recommended for application in ultra low volume (ULV) non-thermal fog to control adult mosquitoes, flies and gnats in residential and recreational areas where these insects are a problem, such as parks, campsites, woodlands, athletic fields, golf courses, residential areas, municipalities, gardens, playgrounds, recreational areas and overgrown waste areas. For best results, treat when insects are most active and conditions are conducive to keeping the fog close to the ground.

Both ground and aerial applications should be made when meteorological conditions are conducive to keeping the spray cloud close to the ground, such as when an air temperature inversion is present. Applications during the cool hours of early morning or evening are preferable. Air temperatures should be greater than 50° F when conducting all types of applications. Application in calm air conditions is to be avoided. Apply only when ground wind speed is greater than 1 mph. Do not apply when wind speeds exceed 10 mph. Applications cannot exceed the recommended rates.

For use by federal, state, tribal, or local government officials responsible for public health or vector control, or by persons certified in the appropriate category or otherwise authorized by the state or tribal lead pesticide regulatory agency to perform adult mosquito control applications, or by persons under their direct supervision.

Do not re-treat a site more than once in 3 days. Do not exceed 25 applications at 0.007 lbs. of permethrin per acre per application or 0.025 lbs. PBO

per acre per application, or 0.18 lbs. of permethrin per acre per season or 2.0 lbs. PBO per acre per year. When targeting *Aedes Taeirorhynchus* and other difficult species, applications of PBO may be made up to 0.08 lbs. PBO per acre. More frequent treatments may be made to prevent or control a threat to public and/or animal health determined by a state, tribal or local health or vector control agency on the basis of documented evidence of disease causing agents in vector mosquitoes or the occurrence of mosquito-borne disease in animal or human populations, or if specifically approved by the state or tribe during a natural disaster recovery effort.

**KONTROL 4 - 4** can be applied over specific growing crops and range grasses prior to harvest for the control of adult mosquitoes and biting flies within or adjacent to these areas. Application can only be made where the following crops are present:

| | | | |
|---|---|---|---|
| Alfalfa | Celery | Filbert | Pears |
| Almonds | Cherries | Garlic | Pepper, bell |
| Apples | Corn, fodder | Range Grasses | Pistachio |
| Artichoke, globe | Corn, forage | Horseradish | Potato |
| Asparagus | Corn, grain (field and pop) | Leafy Vegetables (except Brassica) | Soybeans |
| Avocado | Corn, stover | Lettuce, head | Spinach |
| Broccoli | Corn, sweet kernel plus cob | Mushrooms | Tomatoes |
| Brussels Sprouts | with husks removed | Onion, dry bulb | Vegetable, cucurbits |
| Cabbage | Eggplant | Peaches | Walnuts |
| Cauliflower | | | |

In the treatment of corrals, feedlots, animal confinements/houses, swine lots, poultry ranges and zoos, cover any exposed drinking water, drinking fountains and animal feed before application. Do not contaminate non-approved sites with spray drift.

## GROUND-BASED APPLICATION INSTRUCTIONS (Non-Thermal Application)

**DROPLET SIZE CALIBRATION FOR GROUND-BASED APPLICATION EQUIPMENT:** Spray equipment must be adjusted so that the volume median diameter is less than 30 microns (Dv 0.5 <_30 $\mu$m) and that 90% of the spray is contained in droplets smaller than 48 microns (Dv 0.9 < 48 $\mu$m). Directions from the equipment manufacturer or vendor, pesticide registrant or a test facility using a laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

**Suggested Dilution Rates to Achieve 0.00175# a.i. per Acre**

| | | | HAND HELD THERMAL FOGGERS 50 FT SWATH AT 2 MPH 0.00318# A.I. PER ACRE | |
|---|---|---|---|---|
| MACHINE OUTPUT GAL/HOUR | DILUTION RATIO WITH FOG OIL 5MPH | DILUTION RATIO WITH FOG OIL 10 MPH | MACHINE OUTPUT | DILUTION RATE |
| 10 gal/hr | 1 : 9.5 | 1 : 4.25 | 0.25 gal/hr | 1 : 1.2 |
| 20 gal/hr | 1 : 20 | 1 : 9.5 | 2.0 gal/hr | 1 : 16.4 |
| 30 gal/hr | 1 : 30 | 1 : 14.75 | 5.0 gal/hr | 1 : 42.4 |
| | | | 8.0 gal/hr | 1 : 68.4 |

## NON-THERMAL AEROSOL FOGGER APPLICATION

**KONTROL 4 – 4 ULV Non-Thermal Aerosol Fogger Application:** To control mosquitoes, midges and blackflies, apply **KONTROL 4 – 4** using any standard ULV ground applicator capable of producing a non-thermal aerosol spray. Apply the product at a flow rate of 4.1 to 16.2 ounces per minute at an average vehicle speed of 10 mph. If different vehicle speed is used, adjust the rate accordingly. These rates are equivalent to 0.00175 to 0.007 pounds of permethrin and the same amount of 0.00175 to 0.007 pounds of synergist piperonyl butoxide per acre. Vary flow rates accordingly to vegetation density and mosquito population. Use higher flow rates in heavy vegetation or when populations are high. An accurate flow control system must be used to ensure proper flow rate. **KONTROL 4 – 4** may also be applied by diluting with a suitable solvent such as mineral oil and applying so as not to exceed the maximum pounds of active ingredient per acre as shown in the first column of the ULV table shown below. That table represents some suggested application rates for ground ULV applications. If an alternative dilution rate is used, adjust the flow rate accordingly.

**Conditions and Rates to use KONTROL 4 - 4 Undiluted for Mosquito Control**

| PERMETHRIN/PBO LBS. A.I./ACRE | APPLICATION RATES/FLUID OUNCES TO USE PER MINUTE | | | |
|---|---|---|---|---|
| | 5 mph | 10 mph | 15 mph | 20 mph |
| 0.007/0.007 | 8.1 | 16.2 | 24.4 | 32.5 |
| 0.0035/0.0035 | 4.0 | 8.1 | 12.2 | 16.2 |
| 0.00175/0.00175 | 2.0 | 4.1 | 6.1 | 8.2 |

## AERIAL APPLICATION INSTRUCTIONS

The use of aircraft specially equipped and capable of applying ULTRA LOW VOLUMES of **KONTROL 4 - 4** may be necessary.

**DROPLET SIZE CALIBRATION FOR AERIAL APPLICATION EQUIPMENT:**

**Aerial Application made at ≤ 200 above ground elevation:** Spray equipment must be adjusted so that the volume median diameter produced is less than 60 microns (Dv 0.5 < 60 $\mu$m) and that 90% of the spray is contained in droplets smaller than 100 microns (Dv 0.9 < 100 $\mu$m). The effects of flight speed and, for non-rotary nozzles, nozzle angle on the droplet size spectrum must be considered. Directions from the equipment manufacturer or vendor, pesticide registrant or a test facility using a wind tunnel and laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated.

**Aerial Application made at >200 above ground elevation:** Spray equipment must be adjusted so that the volume median diameter produced is less than 70 microns (Dv 0.5 < 70 $\mu$m) and that 90% of the spray is contained in droplets smaller than 145 microns (Dv 0.9 < 145 $\mu$m). The effects of flight speed and, for non-rotary nozzles, nozzle angle on the droplet size spectrum must be considered. Directions from the equipment manufacturer or vendor, pesticide registrant or a test facility using a wind tunnel and laser-based measurement instrument must be used to adjust equipment to produce acceptable droplet size spectra. Application equipment must be tested at least annually to confirm that pressure at the nozzle and nozzle flow rate(s) are properly calibrated

Do not apply by fixed wing aircraft at a height less than 100 feet, or by helicopter at a height less than 75 feet unless specifically approved by the state or tribe based on public health needs.

Apply at a sufficient airspeed to deliver the appropriate amount of a.i./acre (from 0.00175 to 0.007 # a.i./acre) and to achieve the appropriate droplet range. Flight speed and nozzle orientation must be considered in determining droplet size. Apply when wind speed is greater than 1 mph.

The spray boom should be mounted on the aircraft as to minimize drift caused by wingtip or rotor vortices. The minimum practical boom length should be used and must not exceed 75% of the wing span or 90% rotor diameter.

# STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

**Pesticide Storage and Spill Procedures:** Keep this product in its tightly closed original container when not in use. Store in a cool, dry (preferably locked) area that is designated for such insecticides and also inaccessible to children and animals. Avoid exposure to extreme temperatures. In case of spillage, soak up with absorbent material, such as sawdust or fullers' earth, sweep up and place in a labeled container and dispose of as follows.

**Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Handling: Nonrefillable Container:** Metal or Plastic Container. Do not reuse or refill container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Offer for recycling, if available, reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Triple rinse as follows:**
**Containers 5 gallons or less**: Empty the remaining contents into application equipment and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Once cleaned, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill or by other procedures approved by State and local authorities. Do not cut or weld metal containers.

**Containers larger than 5 gallons:** Empty the remaining contents into application equipment. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Once cleaned, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill or by other procedures approved by State and local authorities.

**Pressure rinse as follows (all sizes):** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

# BULK STORAGE AND DISPOSAL

**AGITATE BEFORE USE**
Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

**Storage:** Ground water contamination may be reduced by diking and flooring of permanent liquid bulk storage sites with an impermeable material.

**Pesticide Disposal:** Pesticide spray mixture or rinsate that cannot be used according to label instructions must be disposed of according to Federal and local procedures under Subtitle C or the Resource Conservation and Recovery Act.

**NOTICE:** Buyer and user assume all risks and liability of use, storage and/or handling of this product not in accordance with the terms of this label.

## BUYER GUARANTEE LIMITED TO LABEL CLAIMS

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