MATERIAL SAFETY DATA SHEET

Univar USA Inc.
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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) (3-phenoxyphenyl) methyl (±) cis, trans-3-(2,2-dichloroethenyl) -2,2-dimethylcyclopropane carboxylate [1]	4.6%
Piperonyl Butoxide (CAS Reg. No. 51-03-6) Equivalent to 80% (butylcarbityl)(6-propylpiperonyl) ether 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 μg/L to 315 μg/L) and aquatic invertebrates (LC_{50} = 0.02 μg/L to 7.6 μg/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.

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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

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
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	May 8, 2009
	October 11, 2012

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.

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