SEKILAS KARISMA (M) SDN. BHD.

(Co. No.: 528804)
No. 11-2 , Jalan Meranti SD 13/4,
Bandar Sri Damansara,
52200 Kuala Lumpur, Malaysia
Tel.: 603-6277 4758 Fax: 603-6272 9528

SAFETY DATA SHEET

MOS SPRAY

1. IDENTIFICATION OF THE PRODUCT & COMPANY IDENTIFICATION

Product Details

Permethrin (25/75) 18.7% + S-bioallethrin 0.8% + PBO 16.8% EC W/W

Company Identification

Supplier Sekilas Karisma (M) Sdn. Bhd
No.11-2 , Jalan Meranti SD 13/4
Bandar Sri Damansara
52200 Kuala Lumpur

Tel: 03-6277 4758
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Identification of substance

Chemical Name	: Mos Spray
Active Ingredient	: Permethrin/S-Bioallethrin/*Piperonyl Butoxide(PBO)
Chemical Nature	: Pyrethroid, * Synergist
Molecular Formula/ MolecularWeight	: Permethrin: $C_{12}H_{20}CI_2O_3$, 391.30 S-Bioallethrin: $C_{19}H_{26}O_3$, 302.41 PBO: $C_{19}H_{30}O_5$, 338.43
IUPAC Name	: Permethrin: 3-phenoxybenzyl (1RS) - cis-trans-3-(2,2-dichlorovinyl)-2,2-dimenthyl cyclopropanecarboxylate. S-Bioallethrin: (S)-3-Ally-2-methly-4-oxocyclopent-2-enyl(1R,3R)-2,2-dimethyl-3-(2-methyl[rop-1-enyl) cyclopropane carboxylate. PBO: 2-(2-Butoxyethoxy) ethyl16-propylpiperonyl ether.

2. COMPOSITION /INFORMATION ON INGREDIENT

Ingredient Name	CAS No	UN No	ECC No.
- Permethrin (18.7%)	52645-53-1	-	613-058-002
- S-Biollethrin (0.8%)	84030-86-4	2902	249-014-0
- Piperonyl Butoxide (PBO) (16.8%)	51-03-6	-	-
- Surfactant Blend (< 8%)	-	-	-
- Aromatic hydrocarbon (52%)	-	1268	-

3. HAZARD IDENTIFICATION

Classification according to EU Directives 67/548/EEC or 1999/45/EC

R20/ 22	Harmful
R65	Harmful
R50/53	Dangerous for the environment

Label elements

Hazard pictograms

Hazard statements

H302	Harmful if swallowed
H332	Harmful if inhaled
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritations
H410	Very toxic to aquatic life with long lasting effects

4. FIRST AID MEASURES

Eyes contact:

Rinse immediately with plenty of water until irritation subside and seek immediate medical advice.

Skin contact:

Remove heavily contaminated clothing. Wash off skin immediately with plenty of soap and water. Seek advice if irritation or rash occurs, or if there is more than trivial exposure.

Inhalation:

Remove to fresh air seek medical advice if there is more than trivial inhalation.

Ingestion:

Rinse mouth with water. Do not induce vomiting. Get Medical attention immediately.

Note to Medical Doctor:

This product contains aromatic hydrocarbon that can produce a severe pneumonitis if aspirated during vomiting. Consideration should be given to gastric lavage with an endotracheal tube in place. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care. Activated charcoal may be given.

5. FIRE FIGHTING MEASURES

Flash point: 41° C

Extinguishing Media : Foam, dry chemical.

Degree of Fire/Explosion Hazard: Moderately combustible. When heated above the flash point, this material releases vapors which, when mixed with air, can burn or be explosive.

Special Fire Fighting procedures: Isolate fire area. Evacuate downwind. Wear full protective clothing and self-contained breathing apparatus. Do not breathe smoke, gases or vapor generated.

6. ACCIDENTAL RELEASE MEASURES

Personal protection : Before intervention wear protective equipment (cf § 8-2). Avoid contact with chemical or contaminated surfaces.

Environmental precautions : Prevent entry into drains, sewers and watercourses. Absorb with liquid binding material sand, cement, lime. Sweep into a suitable container and store the material collected.

Clean-up procedures : Rinse the polluted area with a large quantity of water and cleaning agent.
*Store the washing waters into a suitable container.

7. HANDLING AND STORAGE

Handling

- Special protection measure:
When using does not eat, drink or smoke. Wash hands and exposed skin before meals and after work.

Storage

- Sensitivity to damp, light and Oxidation:
Stable under normal atmospheric conditions when stored in. Closed containers.

- Special storage requirements:
Keep away from food, drink and animal feeding stuffs. Keep out of reach of children. Keep container in a well-ventilated place.

- Storage conditions:
Keep at temperature lower than 40º C

- Shelf life:
At least 2 years if properly packed and stored.

- Recommended packing material:
P.E. or PVE. Lined steel drums

- Packing material to be voided:
Non-lined steel containers

- Incompatible substances:
Sensitive to alkalis and strong acid. Unstable in UV

8. EXPOSURE CONTROL& PERSONAL PROTECTIVE

Personal protective recommendations for mixing or applying this product are prescribed on the product label. Information stated below provides useful, additional guidance for individuals whose use or handling of this product is not guided by the product label:

- Ventilation : Use local exhaust at all process locations where vapor or mist may be emitted. Ventilate all transport vehicles prior to unloading.
- Work Clothing : For splash, mist or spray exposure, wear protective goggles or a face shield.
- Respiratory Prot : For splash, mist or spray exposure wear properly fitted half-face or full-face air-purifying respirator which is approved for pesticides. Respirator use and selection must be based on airborne concentrations.
- Gloves : Wear chemical protective gloves made of materials such as nitrile, neoprene. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Properties

- Appearance	:	Clear greenish yellow liquid
- Odor	:	Aromatic Hydrocarbon
- Specific Gravity	:	0.980 at 20º C
- Solubility	:	Emulsifier
- Weight per volume	:	961 gm/lt
- pH	:	5.0 – 6.0

10. STABILITY AND REACTIVITY

Products of decomposition : No decomposition under normal conditions.

Avoided conditions : *Keep away from heat and source of ignition

11. TOXICOLOGICAL INFORMATION

Permethrin

Rat Acute Oral	:	LD_{50} = 6000 mg/kg
Rabbit Acute Dermal	:	LD_{50} > 2000 mg/kg
Rat Acute Inhalation	:	LD_{50} = 2.3 mg/l/4hr

S-bioallethrin

Rat Acute Oral	:	LD_{50} = 413-574.mg/kg (depending on sex)
Rabbit Acute Dermal	:	LD_{50} > 2000 mg/kg
Rat Acute Inhalation	:	LD_{50} = 1.26 mg/l
Corrosiveness	:	Non corrosive

Sub-acute, sub chronic and prolonged toxicity

- Teratogenicity, mutagenicity, carcinogenicity	:	Non teratogenic, non-mutagenic, non-carcinogenic
- Comments / symptoms	:	Some cutaneous sensations may occur, such as burning, stinging sensations on the face and mucosa, without lesions and transient some hours, maximum 24 hr.

PBO (Piperonyl Butoxide)

Acute Oral	:	LD_{50} Rat : 4570 mg/kg
Acute Dermal	:	LD_{50} Rabbit : > 2000 mg/kg
Inhalation Toxicity	:	LD_{50} 4 hour Rat : >5,9 mg/l
Skin irritation	:	Further to a test on the rabbit according to the OECD criteria, the product is not a dermal irritant
Eye irritation	:	Further to a test on the rabbit according to the OECD criteria, the product is not a dermal irritant.
Induced sensitization	:	Further to a test on the Guinea Pig, the product is not a
Allergic sensitization	:	Dermal sensitizer
Sub-Acute Studies	:	Further to a Full Body Inhalation test on the rat, for three months at the doses of 0,15,74,155,512,mg/m^3, the suggested NOEL is 155 mg/m^3
Teratology/ Reproduction Studies	:	Further to a test on the rabbit with doses of 0,50,100,200 mg/kg/day for 12 days, the product is not teratogenic Diet test on the rat: suggested NOEL = 1000 ppm
Mutagenicity Studies	:	Salmonella / Mammalian – Micro some Reverse Mutation Test: negative Chromosomal Aberrations in Chinese Hamster Ovary Cells: negative Unscheduled DNA Synthesis in Rat Liver Primary Cell Culture: negative Conclusions : the product is not mutagenic
Neurotoxic logic Study	:	A neurotoxicity test on the mouse has been published aimed at pointing out the anticonvulsant properties of Piperonyl Butoxide. The substance showed a low neurotoxic activity (10 thousand times less toxic than Clonazepam) and a Protective Index superior to those of many prototypic anticonvulsants.
Metabolism - Data to determine the pattern of absorption, excretion , distribution, storage and transformation of small doses and their metabolites in the animal body	:	Further to a "Single and repeated Oral Dose Pharmacokinetic" study on the rat, it has been proved that an oxidative attack on the C atom of the methylenedioxy group occurs, thus forming the dihydroxyphenyl compound. An oxidative degradation on the side chain also occurs. The "Single and repeated Oral Does Pharmacokinetic" study on the rat also proved that elimination occurs as the glucoside or amino acid derivative. 55-66% of radioactivity from degraded product was recovered from

		feaces; 27-38% from urines; <1% from tissues and carcass and carcass within 7 days. The JMPR of FAO/WHO concluded that, in animals, piperonyl butoxide can be metabolized at the glycolate side-chain , through hydroxylation at the terminal carbon, oxidation to acid, followed by successive losses of the acetate moiety to from alcohols and acids, which can be conjugated; at the propyl side-chain through opening of the dioxole ring. The main residue in food-2001 issued by the JMPR of FAO and WHO, further to the discussion in Geneva of September 2001 and available on the site.
Chronic studies (2 years)	:	In a two year study in rats (24 month Dietary Toxicity and Carcinogenicity Study in the Albino Rat) no clinical signs related to Piperonyl Buoxide were observed. Ophtalmoscopic examination revealed no changes attributable to PBO treatment ; an increased liver weight resulted when animals were fed at 100 and 500mg/kg bw / day
Special studies Short term toxicity Exposure modes (inhalator dermal)		Further to a "Full Body Inhalation" study on Rat, for three months at 0; 15; 74; 155; 512 mg/m^3. The following conclusions were obtained : all animals survived; irritation to upper airways at 15 mg/m^3 ; effects on the liver at 512 mg/m^3 (WHO conclusions) Further to a "Dermal administration to male and female rabbits" study with one dose per day – 5 days per week – three weeks in total at 0; 100; 300; 1000 mg/kg, the following conclusions were contained; irritation at all dose level; light erythema at 300 and 100mg/kg
Long term Oral Carcinogenicity (Rat and further type of mammals)	:	Rat: Group of rats were fed for two years. The NOAEL was established to be 30mg/kg bw. Mouse: A non-significantly increased incidence of hepatocellular carcinomas was observed in male mice at the high dose (300mg/kg bw) No other treatment related neoplastic or non-neoplastic lesions were found. The NOAEL was established to be 30mg/kg bw. Dog: Group of beagle dogs were fed for one year. The NOAEL was established to be 16mg/kg bw.
Human data-data on epidemiological studies or clinical studies, occupational studies	:	No human epidemiological studies are available. Further to a study on mine men, no effects resulted on the metabolism of antipyrine administered orally at 0,71 mg PBO per kilogram No Symptoms of sensitization or poisoning occurred over 30 year of manufacturing
Diagnosis of poising, specific signs of poisoning ,clinical test		:Even after consulting sound data bank, such as the MMWR Weekly, nothing appears regarding individual cases of poisoning involving the substance itself, as expected when considering its toxicological properties.

No cases of stated irritancy or sensitization have been reported. In the lack of data on humans, a few hypothetical relevant scenarios concerning acute poisoning have been considered. Reference is made to the symptomatology noted on tested animals. Further, a few safety factors have been considered, as followed: The times of appearance has been anticipated by about 24 hours. The time of disappearance has been participated by 24 hours. The relevant doses causing the symptoms have been halved.

Ingestion

-Circumstances of the event:

Since PBO is a liquid supplied in industries packaging this evidence may occur only if a person weighing 50kg wants to commit suicide by drinking more than 250g of a product all at once.

-Symptomatology in the case of no treatment:

Two hours after ingestion, prostration and dark ocular staining would appear. One day after ingestion, prostration would evolve towards lethargism and coma.

Dermal Contamination

-Circumstances of the event:

Since PBO showed a low dermal penetration, this evidence may occur if a person introduces a forearm into an open container filled with the product and does not rinse it for several hours.

-Symptomatology in the case of no treatment:

Within a few hours a well-defined erythema would appear the symptoms would disappear in 2-3 days.

Inhalation

-Circumstances of the event:

This evidence may occur if a person is exposed to an atmosphere containing an aerosol of about 2mg/liter of air for one hour.

-Symptomatology in the case of no treatment:

A few hours after inhalation, excessive lacrimation, salivation, nasal discharge and labored breathing would occur. The symptoms would disappear within 20 days.

Symptomatology and duration of effects should be halved if symptomatic treatment, or gastric lavage (in the case of ingestion) are provided within 2 hours from poisoning.

12. ECOLOGICAL INFORMATION

Ecological Information

Deltamethrin

Decomposition point is very high (>300^{o}C).Thermal decomposition may release .Toxic and/or hazardous gases.

Bioallethrin

Persistence's in the environment

- Biodegradation : Degradable by microorganisms present in soils and waters.
- Chemical degradation : Rapid photo-oxidative degradation when exposed to sunlight.

Toxic effects on organisms

- Aquatic toxicity	: LD_{50} fish	10ug/l (96hrs.)
	: LD_{50} bluegill sunfish	33ug/l (96hrs.)
	: LD_{50} yellow perch	7.8 ug/l (96hrs.)
	: ED_{30} (48 hrs.) Daphnia	8.9 ug/l
- Toxicity to birds	: LD50 Acute oral(bobwhite quail)	>5000mg/kg

- Toxicity to useful insects: Toxic to bees

PBO (Piperonyl Butoxide)

Soil

Persistence of residues in soil. If residues persist in soil state time in days residues likely to remain after use at recommended rate:	: Persistence of PBO in soil is affected by various conditions, such as exposition to sunrays, type of soil, microbial population. In a test for the determination of the photolysis rate on the surface of a sandy loarn soil, a half –life of approximately 1 day was determined. in an aerobic soil metabolism study, a half-life=14 days was determined. The DT_{50} was 50 days. In an Anaerobic soil metabolism study a half-life of 144 days was established. Dosage used in the above test conforms to the requirements of the internationals guidelines for obtaining registration and exceeds by five times (at least) the one typically used for crop treatments.
Main method of degradation In the soil	: Aerobic conditions and the microbial population. Contribute to the degradation of the products, which occurs mainly in the ether-side chain. The principal degrades are methylenedioxi-6-propylbenzyl alcohol and methylenedioxi-6-propylbenzly acid.
Movement in the soil.	: The adsorption/desorption behavior of piperonyl butoxide has been studies in four soils. PBO was moderately well absorbed to the sandy loam, clay loam and silt loam and was not readily desorbed. Piperonyl butoxide was only weakly absorbed to sand. Consequently to this study, PBO can be classified as having low to moderate potential for mobility in sandy loam, clay loam and silt loam.it has a high mobility in sand.
Test of effect on soil organism	: In the Aerobic soil metabolism study quoted at point the level of the microbial population was maintained, apart from a small reduction in actynomycetes and fungi.

Water

Residues in water	: It is important to point out that PBO is not directly used in water and therefore, discussion of its fate in water is relative to run-off issues.
If residues in present following normal use state levels likely to be found following use of	In this respect the conclusions of a few environment studies are reported below. An "Aqueous photolysis" study showed that the half-life of pyperonil Butoxide was 8, 4 hours. The major degradation products were Methylenedioxi-6-propyl benzyl alcohol and aldehyde.
Recommended Rates	In an "Aerobic aquatic metabolism" study, in which PBO was applied to a water/sediment system (in darkness), the DT_{50} and the DT_{80} were respectively calculated to be 213 and 945days.Methylenedioxi-6-propylbenzyl alcohol and acid were the major degradation products. After 30 days, un-extracted and volatile products reached respectively 7.9% and 0.9%in an "Anaerobic aquatic metabolism" study, in which PBO was applied to a water/sediment system (under Nitrogen and in darkness), negligible degradation took place.
Tests of effect on water organism Excluding fish	: In a study conducted on Chlorella fusca and Chlorella sorokiniana, two species pf phototrophic unicellular green algae, the EC_{50} relative to the inhibition of cells volume growth was 44 µmol/L and the EC_{50} relative to the inhibition of cell division was 3.4 µmol/L

Toxicity to Birds, Bees and fish

Acute toxicity in birds (Dietary study LD_{50})	:$LD_{50\ (mg/kg)}$ Northern bobwhite Quail> 2250mg/kg
Sub-acute toxicity in birds	; The LC_{50} (96 hours) for the rainbow trout is 6.12mg/l
Long term toxicity for fish	: A 35-day early life stage on the fathead minnow showed that the NOEC is 0.18 mg/l
Acute toxicity to bees	: LD_{50}>25 µg/bee. Nontoxic to bees.

Effects on other species

Acute toxicity for daphnia (Dietary study, LD_{50})	: LD_{30}(mg/kg) northern Bobwhite quail > 2250mg/kg

Sub-acute toxicity in birds (Dietary study,LD_{50})	: LC_{50} (mg/kg) Anas platyrhynchos > 5620 mg/kg(5 days dietary exposure)
Acute toxicity for fish	: The LC_{50} (96 hours) for the rainbow trout is 6.12mg/l
Long term toxicity for fish	: A 35-day early life stage on the fathead minnow showed that the NOEC is 0.08 mg/l
Acute toxicity to bees	: LD_{50}> 25 µg/bee. Nontoxic to bees.

Effect on other species

Acute toxicity for Daphnia Magna	: The LC_{50} (48hours) for daphnia magna is 0.51 mg/l

13. DISPOSAL CONSIDERATION

Disposal Considerations

Waste and residue	: Waste resulting from the use of this product may be disposed at an approved waste disposal facility. Do not discharge washing waters in public sewers and water sources (ponds, streams)
Empty packaging	: Empty and triple rinse. Make the container unusable. Disposal must be treated according to official local regulation.

14. TRANSPORT INFORMATION

N° UN	: 1993
BY ROAD	
Transport assimilation	: Flammable liquid, n.o.s. (Odorless kerosene)
Class	: 3
Item number	: 31 °c)
Label	: 3
Hazard Code	: 30
O.A.C.I (By Air)	
Transport assimilation	: Flammable liquid, n.o.s. (Odorless kerosene)
Class	: 3
Group	: III
Label	: 3
Passengers	: 309 (60 L)
Cargo	: 310 (220L)
I.M.D.G (By Sea)	
Transport assimilation	: Flammable liquid, n.o.s. (odorless kerosene)
Class	: 3.3
Group	: III
Label	: 3
Mark	: Marine pollutant (S-Bioallethrin-Permethrin)

15. REGULATORY INFORMATION

Regulations on Safety Management of Hazardous Chemicals (issued by Chinese State Council on February 17, 1987)
Regulations on Safety Use of Chemicals at Work (issued by Chinese Ministry of Labor in 1996)

16. OTHER INFORMATION

All information and instructions provided in this Safety Data Sheet (SDS) are based on the current state of scientific and technical knowledge at the date indicated on the present SDS and are presented in good faith and believed to be correct. This information applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this SDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipient's sole responsibility to ensure the transfer of all relevant information from this SDS to their own SDS.

Revised Date: May 2018