

**Permethrin Liquid Formulation**

Version	Revision Date:	SDS Number:	Date of last issue: 06.04.2024
4.0	14.04.2025	10831055-00005	Date of first issue: 15.08.2022

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**Section 1: Identification**

**Product identifier** : Permethrin Liquid Formulation

**Recommended use of the chemical and restrictions on use**

Recommended use : Veterinary product  
Restrictions on use : Not applicable

**Manufacturer or supplier's details**

Company : MSD  
Address : 50 Tuas West Drive  
Singapore - Singapore 638408  
Telephone : +1-908-740-4000  
Emergency telephone number : 65 6697 2111 (24/7/365)  
E-mail address : EHSDATASTEWARD@msd.com

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**Section 2: Hazard identification****Classification of the substance or mixture**

Flammable liquids : Category 3  
Acute toxicity (Oral) : Category 4  
Skin sensitisation : Category 1  
Germ cell mutagenicity : Category 1B  
Carcinogenicity : Category 1B  
Specific target organ toxicity - single exposure : Category 3  
Aspiration hazard : Category 1  
Short-term (acute) aquatic hazard : Category 1  
Long-term (chronic) aquatic hazard : Category 1

**GHS Label elements, including precautionary statements**

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Hazard pictograms

:



Signal word

:

Danger

Hazard statements

:

H226 Flammable liquid and vapour.  
H302 Harmful if swallowed.  
H304 May be fatal if swallowed and enters airways.  
H317 May cause an allergic skin reaction.  
H336 May cause drowsiness or dizziness.  
H340 May cause genetic defects.  
H350 May cause cancer.  
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

:

**Prevention:**

P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P233 Keep container tightly closed.  
P241 Use explosion-proof electrical/ ventilating/ lighting equipment.  
P242 Use non-sparking tools.  
P243 Take action to prevent static discharges.  
P261 Avoid breathing mist or vapours.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.  
P272 Contaminated work clothing should not be allowed out of the workplace.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

**Response:**

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.  
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.  
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.  
P308 + P313 IF exposed or concerned: Get medical advice/ attention.  
P331 Do NOT induce vomiting.  
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.  
P362 + P364 Take off contaminated clothing and wash it before reuse.  
P391 Collect spillage.

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**Storage:**

P403 + P235 Store in a well-ventilated place. Keep cool.  
P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards which do not result in classification**

Cutaneous sensations may occur, such as burning or stinging on the face and mucosae. However, these sensations cause no lesions and are of a transitory nature (max. 24 hours).  
Vapours may form explosive mixture with air.

**Section 3: Composition/information on ingredients**

Substance / Mixture : Mixture

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
White mineral oil (petroleum)	8042-47-5	>= 50 -< 70
Permethrin (ISO)	52645-53-1	>= 25 -< 30
Hydrocarbons, C10, aromatics, <1% naphthalene	64742-94-5	>= 10 -< 20
Solvent naphtha (petroleum), light aromatic	64742-95-6	>= 2.5 -< 10

**Section 4: First-aid measures****Description of necessary first-aid measures**

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.  
Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with plenty of water.  
Remove contaminated clothing and shoes.  
Get medical attention.  
Wash clothing before reuse.  
Thoroughly clean shoes before reuse.

In case of eye contact : Flush eyes with water as a precaution.  
Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.  
If vomiting occurs have person lean forward.  
Call a physician or poison control centre immediately.  
Rinse mouth thoroughly with water.  
Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed**

Risks : This product contains a pyrethroid.  
Pyrethroid poisoning should not be confused with carbamate

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or organophosphate poisoning.  
Harmful if swallowed.  
May be fatal if swallowed and enters airways.  
May cause an allergic skin reaction.  
May cause drowsiness or dizziness.  
May cause genetic defects.  
May cause cancer.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

**Indication of any immediate medical attention and special treatment needed**

Treatment : Treat symptomatically and supportively.

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**Section 5: Fire-fighting measures****Extinguishing media**

Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical

Unsuitable extinguishing media : High volume water jet

**Special hazards arising from the substance or mixture**

Specific hazards during fire-fighting : Do not use a solid water stream as it may scatter and spread fire.  
Flash back possible over considerable distance.  
Vapours may form explosive mixtures with air.  
Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Chlorine compounds  
Carbon oxides

**Special protective actions for fire-fighters**

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.

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**Section 6: Accidental release measures****Personal precautions, protective equipment and emergency procedures**

Personal precautions : Remove all sources of ignition.

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Use personal protective equipment.  
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

**Environmental precautions**

Environmental precautions : Avoid release to the environment.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.

**Methods and materials for containment and cleaning up**

Methods for cleaning up : Non-sparking tools should be used.  
Soak up with inert absorbent material.  
Suppress (knock down) gases/vapours/mists with a water spray jet.  
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

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**Section 7: Handling and storage****Precautions for safe handling**

Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation.  
Use explosion-proof electrical, ventilating and lighting equipment.

Advice on safe handling : Do not get on skin or clothing.  
Avoid breathing mist or vapours.  
Do not swallow.  
Avoid contact with eyes.  
Wash skin thoroughly after handling.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment  
Non-sparking tools should be used.  
Keep container tightly closed.  
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

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Take precautionary measures against static discharges.  
Do not eat, drink or smoke when using this product.  
Take care to prevent spills, waste and minimize release to the environment.

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.  
When using do not eat, drink or smoke.  
Contaminated work clothing should not be allowed out of the workplace.  
Wash contaminated clothing before re-use.  
The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

**Conditions for safe storage, including any incompatibilities**

Conditions for safe storage : Keep in properly labelled containers.  
Store locked up.  
Keep tightly closed.  
Keep in a cool, well-ventilated place.  
Store in accordance with the particular national regulations.  
Keep away from heat and sources of ignition.

Materials to avoid : Do not store with the following product types:  
Self-reactive substances and mixtures  
Organic peroxides  
Oxidizing agents  
Flammable gases  
Pyrophoric liquids  
Pyrophoric solids  
Self-heating substances and mixtures  
Poisonous gases  
Explosives

**Section 8: Exposure controls/personal protection****Control parameters****Occupational Exposure Limits**

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
White mineral oil (petroleum)	8042-47-5	PEL (long term) (Mist)	5 mg/m <sup>3</sup>	SG OEL
		PEL (short term) (Mist)	10 mg/m <sup>3</sup>	SG OEL
		TWA (Inhalable particulate matter)	5 mg/m <sup>3</sup>	ACGIH

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Permethrin (ISO)	52645-53-1	TWA	80 µg/m <sup>3</sup> (OEB 3)	Internal
		Wipe limit	800 µg/100 cm <sup>2</sup>	Internal
Hydrocarbons, C10, aromatics, <1% naphthalene	64742-94-5	PEL (long term) (Mist)	5 mg/m <sup>3</sup>	SG OEL
		PEL (short term) (Mist)	10 mg/m <sup>3</sup>	SG OEL
		TWA (Inhalable particulate matter)	5 mg/m <sup>3</sup>	ACGIH
Solvent naphtha (petroleum), light aromatic	64742-95-6	TWA	200 mg/m <sup>3</sup> (total hydrocarbon vapor)	ACGIH

### Appropriate engineering control measures

- : Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., drip-less quick connections).
- All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.
- Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).
- Minimize open handling.
- Use explosion-proof electrical, ventilating and lighting equipment.

### Individual protection measures, such as personal protective equipment (PPE)

- Eye/face protection : Wear safety glasses with side shields or goggles.  
If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.  
Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.
- Skin protection : Work uniform or laboratory coat.  
Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces.  
Use appropriate degowning techniques to remove potentially contaminated clothing.
- Respiratory protection : If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
- Filter type : Combined particulates and organic vapour type
- Hand protection
- Material : Chemical-resistant gloves
- Remarks : Consider double gloving. Take note that the product is flammable, which may impact the selection of hand protection.

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**Section 9: Physical and chemical properties**

Appearance	: liquid
Colour	: amber
Odour	: aromatic
Odour Threshold	: No data available
pH	: No data available
Melting point/freezing point	: No data available
Initial boiling point and boiling range	: No data available
Flash point	: 46 °C
Evaporation rate	: No data available
Flammability (solid, gas)	: Not applicable
Flammability (liquids)	: Ignitable (see flash point)
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapour pressure	: No data available
Relative vapour density	: No data available
Relative density	: No data available
Density	: No data available
Solubility(ies) Water solubility	: No data available
Partition coefficient: n-octanol/water	: Not applicable
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity Viscosity, kinematic	: No data available



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Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available
Particle characteristics	:	
Particle size	:	Not applicable

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**Section 10: Stability and reactivity**

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Flammable liquid and vapour. Vapours may form explosive mixture with air. Can react with strong oxidizing agents.
Conditions to avoid	:	Heat, flames and sparks.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	No hazardous decomposition products are known.

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**Section 11: Toxicological information**

Information on likely routes of exposure	:	Inhalation Skin contact Ingestion Eye contact
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**Acute toxicity**

Harmful if swallowed.

**Product:**

Acute oral toxicity	:	Acute toxicity estimate: 1,965 mg/kg Method: Calculation method
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Acute inhalation toxicity	:	Acute toxicity estimate: > 5 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
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**Components:****White mineral oil (petroleum):**

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 5 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhala-

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	tion toxicity
Acute dermal toxicity	: LD50 (Rabbit): > 2,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

### Permethrin (ISO):

Acute oral toxicity	: LD50 (Rat): 480 - 554 mg/kg
Acute inhalation toxicity	: LC50 (Rat): 2.3 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	: LD50 (Rabbit): > 2,000 mg/kg

### Hydrocarbons, C10, aromatics, <1% naphthalene:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 420 Remarks: Based on data from similar materials
Acute inhalation toxicity	: LC50 (Rat): > 4.778 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Remarks: Based on data from similar materials
Acute dermal toxicity	: LD50 (Rabbit): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity Remarks: Based on data from similar materials

### Solvent naphtha (petroleum), light aromatic:

Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity	: LC50 (Rat): > 5.61 mg/l Exposure time: 4 h Test atmosphere: vapour
Acute dermal toxicity	: LD50 (Rabbit): > 2,000 mg/kg

### Skin corrosion/irritation

Not classified based on available information.

### Components:

#### White mineral oil (petroleum):

Species	: Rabbit
Result	: No skin irritation

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**Permethrin (ISO):**

Species	: Rabbit
Result	: No skin irritation

**Hydrocarbons, C10, aromatics, <1% naphthalene:**

Assessment	: Repeated exposure may cause skin dryness or cracking.
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**Solvent naphtha (petroleum), light aromatic:**

Species	: Rabbit
Method	: OECD Test Guideline 404
Result	: Skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:****White mineral oil (petroleum):**

Species	: Rabbit
Result	: No eye irritation

**Permethrin (ISO):**

Species	: Rabbit
Result	: No eye irritation

**Hydrocarbons, C10, aromatics, <1% naphthalene:**

Species	: Rabbit
Result	: No eye irritation
Remarks	: Based on data from similar materials

**Solvent naphtha (petroleum), light aromatic:**

Species	: Rabbit
Result	: No eye irritation
Method	: OECD Test Guideline 405

**Respiratory or skin sensitisation****Skin sensitisation**

May cause an allergic skin reaction.

**Respiratory sensitisation**

Not classified based on available information.

**Components:****White mineral oil (petroleum):**

Test Type	: Buehler Test
Exposure routes	: Skin contact

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Species	: Guinea pig
Result	: negative

**Permethrin (ISO):**

Test Type	: Buehler Test
Exposure routes	: Skin contact
Species	: Guinea pig
Result	: positive

Assessment	: Probability or evidence of skin sensitisation in humans
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**Hydrocarbons, C10, aromatics, <1% naphthalene:**

Test Type	: Maximisation Test
Exposure routes	: Skin contact
Species	: Guinea pig
Result	: negative
Remarks	: Based on data from similar materials

**Solvent naphtha (petroleum), light aromatic:**

Test Type	: Buehler Test
Exposure routes	: Skin contact
Species	: Guinea pig
Result	: negative

**Germ cell mutagenicity**

May cause genetic defects.

**Components:****White mineral oil (petroleum):**

Genotoxicity in vitro	: Test Type: In vitro mammalian cell gene mutation test Result: negative
Genotoxicity in vivo	: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Intraperitoneal injection Method: OECD Test Guideline 474 Result: negative Remarks: Based on data from similar materials

**Permethrin (ISO):**

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Result: negative  Test Type: In vitro mammalian cell gene mutation test Result: negative  Test Type: Chromosome aberration test in vitro
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		Result: negative
		Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
		Result: negative
		Test Type: Chromosome aberration test in vitro
		Result: positive
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
		Species: Mouse
		Result: negative
		Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
		Species: Mouse
		Result: negative
		Test Type: Rodent dominant lethal test (germ cell) (in vivo)
		Species: Mouse
		Result: negative
		Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
		Species: Rat
		Application Route: Intraperitoneal injection
		Result: negative
		Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
		Species: Mouse
		Application Route: Ingestion
		Result: positive
Germ cell mutagenicity - Assessment	:	Weight of evidence does not support classification as a germ cell mutagen.

**Hydrocarbons, C10, aromatics, <1% naphthalene:**

Genotoxicity in vitro	:	Test Type: In vitro sister chromatid exchange assay in mammalian cells
		Result: negative
		Remarks: Based on data from similar materials
Genotoxicity in vivo	:	Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
		Species: Rat
		Application Route: inhalation (vapour)
		Result: negative
		Remarks: Based on data from similar materials

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**Solvent naphtha (petroleum), light aromatic:**

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
		Test Type: In vitro mammalian cell gene mutation test Result: positive
Genotoxicity in vivo	:	Test Type: Sister chromatid exchange analysis in spermatogonia Species: Mouse Application Route: Intraperitoneal injection Result: positive
Germ cell mutagenicity - Assessment	:	Positive result(s) from in vivo heritable germ cell mutagenicity tests in mammals

**Carcinogenicity**

May cause cancer.

**Components:****White mineral oil (petroleum):**

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	24 Months
Result	:	negative

**Permethrin (ISO):**

Species	:	Rat
Result	:	negative

Species	:	Mouse
Result	:	negative

**Solvent naphtha (petroleum), light aromatic:**

Species	:	Mouse
Application Route	:	Skin contact
Exposure time	:	2 Years
Result	:	positive

Carcinogenicity - Assessment	:	Sufficient evidence of carcinogenicity in animal experiments
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**Reproductive toxicity**

Not classified based on available information.

**Components:****White mineral oil (petroleum):**

Effects on fertility	:	Test Type: One-generation reproduction toxicity study Species: Rat
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	Application Route: Skin contact
	Result: negative
Effects on foetal development	: Test Type: Embryo-foetal development
	Species: Rat
	Application Route: Ingestion
	Result: negative

**Permethrin (ISO):**

Effects on fertility	: Test Type: Two-generation reproduction toxicity study
	Species: Rat
	Application Route: Ingestion
	Result: negative
Effects on foetal development	: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
	Species: Rat
	Application Route: Ingestion
	Result: negative

**Hydrocarbons, C10, aromatics, <1% naphthalene:**

Effects on fertility	: Test Type: Three-generation reproduction toxicity study
	Species: Rat
	Application Route: inhalation (vapour)
	Result: negative
	Remarks: Based on data from similar materials
Effects on foetal development	: Test Type: Embryo-foetal development
	Species: Rat
	Application Route: Ingestion
	Result: negative
	Remarks: Based on data from similar materials

**Solvent naphtha (petroleum), light aromatic:**

Effects on fertility	: Test Type: Reproduction/Developmental toxicity screening test
	Species: Rat
	Application Route: inhalation (vapour)
	Result: negative
Effects on foetal development	: Test Type: Embryo-foetal development
	Species: Rat
	Application Route: inhalation (vapour)
	Result: negative

**STOT - single exposure**

May cause drowsiness or dizziness.

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**Components:****Hydrocarbons, C10, aromatics, <1% naphthalene:**

Assessment	: May cause drowsiness or dizziness.
Remarks	: Based on data from similar materials

**Solvent naphtha (petroleum), light aromatic:**

Assessment	: May cause drowsiness or dizziness.
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**STOT - repeated exposure**

Not classified based on available information.

**Repeated dose toxicity****Components:****White mineral oil (petroleum):**

Species	: Rat
LOAEL	: 160 mg/kg
Application Route	: Ingestion
Exposure time	: 90 Days

Species	: Rat
LOAEL	: $\geq 1$ mg/l
Application Route	: inhalation (dust/mist/fume)
Exposure time	: 4 Weeks
Method	: OECD Test Guideline 412

**Permethrin (ISO):**

Species	: Rat
NOAEL	: 0.2201 mg/l
Application Route	: Inhalation
Exposure time	: 90 Days

Species	: Rat
NOAEL	: 175 mg/kg
Application Route	: Ingestion
Exposure time	: 90 Days

**Hydrocarbons, C10, aromatics, <1% naphthalene:**

Species	: Rat
NOAEL	: 300 mg/kg
Application Route	: Ingestion
Exposure time	: 13 Weeks
Remarks	: Based on data from similar materials

**Solvent naphtha (petroleum), light aromatic:**

Species	: Rat
LOAEL	: 500 mg/kg



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Application Route : Ingestion  
Exposure time : 28 Days

**Aspiration toxicity**

May be fatal if swallowed and enters airways.

**Components:****Hydrocarbons, C10, aromatics, <1% naphthalene:**

The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

**Solvent naphtha (petroleum), light aromatic:**

The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

**Section 12: Ecological information****Toxicity****Components:****White mineral oil (petroleum):**

Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	: NOEC (Pseudokirchneriella subcapitata (green algae)): 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to fish (Chronic toxicity)	: NOEC (Oncorhynchus mykiss (rainbow trout)): 1,000 mg/l Exposure time: 28 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): 1,000 mg/l Exposure time: 21 d

**Permethrin (ISO):**

Toxicity to fish	: LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.00079 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 0.0001 mg/l Exposure time: 48 h

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Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1.13 mg/l Exposure time: 72 h  EC10 (Pseudokirchneriella subcapitata (green algae)): 0.0023 mg/l Exposure time: 72 h
M-Factor (Acute aquatic toxicity)	:	10,000
Toxicity to fish (Chronic toxicity)	:	NOEC (Danio rerio (zebra fish)): 0.00041 mg/l Exposure time: 35 d Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.0047 µg/l Exposure time: 21 d Method: OECD Test Guideline 211
M-Factor (Chronic aquatic toxicity)	:	10,000
Toxicity to microorganisms	:	EC50: > 1,000 mg/l Exposure time: 3 h

**Hydrocarbons, C10, aromatics, <1% naphthalene:**

Toxicity to fish	:	LL50 (Oncorhynchus mykiss (rainbow trout)): 2 - 5 mg/l Exposure time: 96 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 203 Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 3 - 10 mg/l Exposure time: 48 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 202 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	:	EL50 (Pseudokirchneriella subcapitata (green algae)): > 1 - 3 mg/l Exposure time: 72 h Test substance: Water Accommodated Fraction Method: OECD Test Guideline 201 Remarks: Based on data from similar materials

**Solvent naphtha (petroleum), light aromatic:**

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 8.2 mg/l Exposure time: 96 h Test substance: Water Accommodated Fraction
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 4.5 mg/l Exposure time: 48 h Test substance: Water Accommodated Fraction

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Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (*Pseudokirchneriella subcapitata* (microalgae)): 3.1 mg/l  
Exposure time: 96 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201

NOELR (*Pseudokirchneriella subcapitata* (microalgae)): 0.5 mg/l  
Exposure time: 96 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOELR (*Daphnia magna* (Water flea)): 2.6 mg/l  
Exposure time: 21 d  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 211

**Persistence and degradability****Components:****White mineral oil (petroleum):**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 31 %  
Exposure time: 28 d

**Permethrin (ISO):**

Biodegradability : Result: Not readily biodegradable.  
Method: OECD Test Guideline 301F

**Hydrocarbons, C10, aromatics, <1% naphthalene:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 49.56 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**Solvent naphtha (petroleum), light aromatic:**

Biodegradability : Result: Inherently biodegradable.  
Biodegradation: 94 %  
Exposure time: 25 d

**Bioaccumulative potential****Components:****Permethrin (ISO):**

Bioaccumulation : Species: *Lepomis macrochirus* (Bluegill sunfish)  
Bioconcentration factor (BCF): 570

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Partition coefficient: n-octanol/water : log Pow: 4.67

**Mobility in soil**

No data available

**Other adverse effects**

No data available

**Section 13: Disposal considerations****Disposal methods**

Waste from residues : Do not dispose of waste into sewer.  
Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
Empty containers retain residue and can be dangerous.  
Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death.  
If not otherwise specified: Dispose of as unused product.

**Section 14: Transport information****International Regulations****UNRTDG**

UN number : UN 1993

UN proper shipping name : FLAMMABLE LIQUID, N.O.S.  
(Solvent naphtha (petroleum), light aromatic)

Transport hazard class(es) : 3

Packing group : III

Labels : 3

Environmental hazards : no

**IATA-DGR**

UN/ID No. : UN 1993

UN proper shipping name : Flammable liquid, n.o.s.  
(Solvent naphtha (petroleum), light aromatic)

Transport hazard class(es) : 3

Packing group : III

Labels : Flammable Liquids

Packing instruction (cargo aircraft) : 366

Packing instruction (passenger aircraft) : 355

**IMDG-Code**

UN number : UN 1993

Proper shipping name : FLAMMABLE LIQUID, N.O.S.  
(Solvent naphtha (petroleum), light aromatic, Permethrin (ISO))

## Permethrin Liquid Formulation

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Transport hazard class(es) : 3  
Packing group : III  
Labels : 3  
EmS Code : F-E, S-E  
Marine pollutant : yes

**Transport in bulk according to IMO instruments**

Not applicable for product as supplied.

**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

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**Section 15: Regulatory information****Safety, health and environmental regulations specific for the product in question**

Workplace Safety and Health Act and Workplace Safety and Health (General Provisions) Regulations: This product is subject to the requirements in the Act/Regulations.

Environmental Protection and Management Act and Environmental Protection and Management (Hazard- ous Substances) Regulations	: Pyrethroid compounds used as pes- ticides
Fire Safety (Petroleum and Flammable Materials) Regulations	: Petroleum oil Petroleum distillates

**The components of this product are reported in the following inventories:**

AICS	: not determined
DSL	: not determined
IECSC	: not determined

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**Section 16: Other information**

Revision Date : 14.04.2025

**Further information**

Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Date format : dd.mm.yyyy

**Full text of other abbreviations**

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
SG OEL	: Singapore. Workplace Safety and Health (General Provisions) Regulations - First Schedule Permissible Exposure Limits of

**Permethrin Liquid Formulation**

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## Toxic Substances.

ACGIH / TWA	:	8-hour, time-weighted average
SG OEL / PEL (long term)	:	Permissible Exposure Level (PEL) Long Term
SG OEL / PEL (short term)	:	Permissible Exposure Level (PEL) Short Term

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

SG / EN