

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28 Date of first issue: 2016/05/16

1. PRODUCT AND COMPANY IDENTIFICATION

Chemical product name : Permethrin / Piperonyl Butoxide Formulation

Supplier's company name, address and phone number

Company name of supplier : MSD

Address : 1-13-12, Kudan-kita, Chiyoda-ku, Tokyo, Japan

Telephone : 03-6272-1099

E-mail address : EHSDATASTEWARD@msd.com

Emergency telephone number : +1-908-423-6000

Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product

Restrictions on use : Not applicable

2. HAZARDS IDENTIFICATION

GHS classification of chemical product

Skin sensitisation : Category 1

Aspiration hazard : Category 1

Short-term (acute) aquatic hazard : Category 1

Long-term (chronic) aquatic hazard : Category 1

GHS label elements

Hazard pictograms : 

Signal word : Danger

Hazard statements : H304 May be fatal if swallowed and enters airways.
H317 May cause an allergic skin reaction.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P261 Avoid breathing mist or vapours.

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1	Revision Date: 2025/04/14	SDS Number: 677259-00021	Date of last issue: 2024/09/28 Date of first issue: 2016/05/16
----------------	------------------------------	-----------------------------	---

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.

P302 + P352 IF ON SKIN: Wash with plenty of water.

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.

Storage:

P405 Store locked up.

Disposal:

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

Other hazards which do not result in classification

Important symptoms and outlines of the emergency assumed : 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).

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)	ENCS No.
Distillates (petroleum), solvent-refined light paraffinic	64741-89-5	>= 40 - <= 80	9-1700
Distillates (petroleum), solvent refined heavy paraffinic	64741-88-4	>= 10 - <= 50	9-1692
2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether	51-03-6	5	9-1484
Permethrin (ISO)	52645-53-1	5	3-4010

4. 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.

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

In case of skin contact	<p>Get medical attention if symptoms occur.</p> <p>: In case of contact, immediately flush skin with soap and plenty of water.</p> <p>Remove contaminated clothing and shoes.</p> <p>Get medical attention.</p> <p>Wash clothing before reuse.</p> <p>Thoroughly clean shoes before reuse.</p>
In case of eye contact	<p>: Flush eyes with water as a precaution.</p> <p>Get medical attention if irritation develops and persists.</p>
If swallowed	<p>: If swallowed, DO NOT induce vomiting.</p> <p>If vomiting occurs have person lean forward.</p> <p>Call a physician or poison control centre immediately.</p> <p>Never give anything by mouth to an unconscious person.</p>
Most important symptoms and effects, both acute and delayed	<p>: This product contains a pyrethroid.</p> <p>Pyrethroid poisoning should not be confused with carbamate or organophosphate poisoning.</p> <p>May be fatal if swallowed and enters airways.</p> <p>May cause an allergic skin reaction.</p>
Protection of first-aiders	<p>: 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).</p>
Notes to physician	<p>: Treat symptomatically and supportively.</p>

5. FIREFIGHTING MEASURES

Suitable extinguishing media	<p>: Water spray</p> <p>Alcohol-resistant foam</p> <p>Carbon dioxide (CO₂)</p> <p>Dry chemical</p>
Unsuitable extinguishing media	<p>: None known.</p>
Specific hazards during fire-fighting	<p>: Exposure to combustion products may be a hazard to health.</p>
Hazardous combustion products	<p>: Chlorine compounds</p> <p>Carbon oxides</p>
Specific extinguishing methods	<p>: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.</p> <p>Use water spray to cool unopened containers.</p> <p>Remove undamaged containers from fire area if it is safe to do so.</p> <p>Evacuate area.</p>
Special protective equipment for firefighters	<p>: In the event of fire, wear self-contained breathing apparatus.</p> <p>Use personal protective equipment.</p>

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protection	<p>: Use personal protective equipment.</p>
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SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1	Revision Date: 2025/04/14	SDS Number: 677259-00021	Date of last issue: 2024/09/28 Date of first issue: 2016/05/16
----------------	------------------------------	-----------------------------	---

tive equipment and emergency procedures	Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
Environmental precautions	<ul style="list-style-type: none">: 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	<ul style="list-style-type: none">: Soak up with inert absorbent material.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.

7. HANDLING AND STORAGE

Handling

Technical measures	<ul style="list-style-type: none">: See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation	<ul style="list-style-type: none">: Use only with adequate ventilation.
Advice on safe handling	<ul style="list-style-type: none">: Do not get on skin or clothing.Avoid breathing mist or vapours.Do not swallow.Avoid contact with eyes.Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessmentKeep container tightly closed.Take care to prevent spills, waste and minimize release to the environment.
Avoidance of contact	<ul style="list-style-type: none">: Oxidizing agents
Hygiene measures	<ul style="list-style-type: none">: 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.

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version
8.1

Revision Date:
2025/04/14

SDS Number:
677259-00021

Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Storage

Conditions for safe storage : Keep in properly labelled containers.
Store locked up.
Keep tightly closed.
Store in accordance with the particular national regulations.

Materials to avoid : Do not store with the following product types:
Strong oxidizing agents

Packaging material : Unsuitable material: None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Threshold limit value and permissible exposure limits for each component in the work environment

Components	CAS-No.	Value type (Form of exposure)	Control param- eters / Concentra- tion standard / Permissible con- centration	Basis
Distillates (petroleum), solvent-refined light paraffinic	64741-89-5	TWA (Inhalable particulate matter)	5 mg/m ³	ACGIH
Permethrin (ISO)	52645-53-1	TWA	80 µg/m ³ (OEB 3)	Internal
2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether	51-03-6	Wipe limit	800 µg/100 cm ²	Internal

Engineering measures : Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.

Personal protective equipment

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 : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

Eye protection : Wear the following personal protective equipment:
Safety glasses

Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure

Permethrin / Piperonyl Butoxide FormulationVersion
8.1Revision Date:
2025/04/14SDS Number:
677259-00021Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

potential.

Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	liquid
Colour	:	amber
Odour	:	odourless
Odour Threshold	:	No data available
Melting point/freezing point	:	No data available
Boiling point, initial boiling point and boiling range	:	No data available
Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	No data available
Lower explosion limit and upper explosion limit / flammability limit		
Upper explosion limit / Up- per flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Flash point	:	No data available
Decomposition temperature	:	No data available
pH	:	No data available
Evaporation rate	:	No data available
Auto-ignition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	40 mPa.s
Viscosity, kinematic	:	No data available
Solubility(ies)		
Water solubility	:	negligible
Partition coefficient: n-octanol/water	:	Not applicable
Vapour pressure	:	< 2 mmHg (25 °C)

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28 Date of first issue: 2016/05/16

Density and / or relative density
Relative density : No data available

Density : 0.885 g/cm³

Relative vapour density : No data available

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

10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Can react with strong oxidizing agents.

Conditions to avoid : None known.

Incompatible materials : Oxidizing agents

Hazardous decomposition products : No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: > 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

Distillates (petroleum), solvent-refined light paraffinic:

Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat): > 5.53 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Method: OECD Test Guideline 402

Distillates (petroleum), solvent refined heavy paraffinic:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Method: OECD Test Guideline 401
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 5.53 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Method: OECD Test Guideline 402
Remarks: Based on data from similar materials

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 423

Acute inhalation toxicity : LC50 (Rat): > 5.2 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 402

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

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Skin corrosion/irritation

Not classified based on available information.

Components:

Distillates (petroleum), solvent-refined light paraffinic:

Species : Rabbit
Result : No skin irritation

Distillates (petroleum), solvent refined heavy paraffinic:

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

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Assessment : Repeated exposure may cause skin dryness or cracking.

Permethrin (ISO):

Species : Rabbit
Result : No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Components:

Distillates (petroleum), solvent-refined light paraffinic:

Species : Rabbit
Result : No eye irritation

Distillates (petroleum), solvent refined heavy paraffinic:

Species : Rabbit
Result : No eye irritation
Method : OECD Test Guideline 405
Remarks : Based on data from similar materials

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Species : Rabbit
Result : Irritation to eyes, reversing within 21 days
Method : OECD Test Guideline 405

Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Permethrin (ISO):

Species : Rabbit
Result : No eye irritation

Respiratory or skin sensitisation**Skin sensitisation**

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified based on available information.

Components:**Distillates (petroleum), solvent-refined light paraffinic:**

Test Type : Buehler Test
Exposure routes : Skin contact
Species : Guinea pig
Method : OECD Test Guideline 406
Result : negative

Distillates (petroleum), solvent refined heavy paraffinic:

Test Type : Buehler Test
Exposure routes : Skin contact
Species : Guinea pig
Method : OECD Test Guideline 406
Result : negative
Remarks : Based on data from similar materials

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Test Type : Maximisation Test
Exposure routes : Skin contact
Species : Guinea pig
Method : OECD Test Guideline 406
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

Germ cell mutagenicity

Not classified based on available information.

Components:**Distillates (petroleum), solvent-refined light paraffinic:**

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1	Revision Date: 2025/04/14	SDS Number: 677259-00021	Date of last issue: 2024/09/28
			Date of first issue: 2016/05/16

Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro
Result: negative
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Result: negative

Distillates (petroleum), solvent refined heavy paraffinic:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative
Remarks: Based on data from similar materials

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

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

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
Result: negative

Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)

Permethrin / Piperonyl Butoxide FormulationVersion
8.1Revision Date:
2025/04/14SDS Number:
677259-00021Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

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.

Carcinogenicity

Not classified based on available information.

Components:**Distillates (petroleum), solvent-refined light paraffinic:**

Species	:	Mouse, female
Application Route	:	Skin contact
Exposure time	:	18 Months
Method	:	OECD Test Guideline 451
Result	:	negative

Distillates (petroleum), solvent refined heavy paraffinic:

Species	:	Mouse
Application Route	:	Skin contact
Exposure time	:	78 weeks
Result	:	negative

Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Remarks : Based on data from similar materials

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Species : Rat
Application Route : Ingestion
Exposure time : 107 weeks
Method : OECD Test Guideline 451
Result : negative

Permethrin (ISO):

Species : Rat
Result : negative

Species : Mouse
Result : negative

Reproductive toxicity

Not classified based on available information.

Components:**Distillates (petroleum), solvent-refined light paraffinic:**

Effects on fertility : Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative

Distillates (petroleum), solvent refined heavy paraffinic:

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 421
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Skin contact
Result: negative
Remarks: Based on data from similar materials

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative

Effects on foetal development : Test Type: Embryo-foetal development

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version Revision Date: SDS Number: Date of last issue: 2024/09/28
8.1 2025/04/14 677259-00021 Date of first issue: 2016/05/16

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

STOT - single exposure

Not classified based on available information.

Components:

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Assessment : May cause respiratory irritation.

STOT - repeated exposure

Not classified based on available information.

Repeated dose toxicity

Components:

Distillates (petroleum), solvent-refined light paraffinic:

Species	:	Rabbit
NOAEL	:	1,000 mg/kg
Application Route	:	Skin contact
Exposure time	:	4 Weeks
Method	:	OECD Test Guideline 410
Remarks	:	Based on data from similar materials

Species	Rat
NOAEL	> 980 mg/m ³
Application Route	inhalation (dust/mist/fume)
Exposure time	4 Weeks
Remarks	Based on data from similar materials

Distillates (petroleum), solvent refined heavy paraffinic:

Species : Rabbit
NOAEL : 1,000 mg/kg
Application Route : Skin contact
Exposure time : 4 Weeks

Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Method : OECD Test Guideline 410
Remarks : Based on data from similar materials

Species : Rat
NOAEL : > 980 mg/m³
Application Route : inhalation (dust/mist/fume)
Exposure time : 4 Weeks
Remarks : Based on data from similar materials

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Species : Rat
NOAEL : 1,323 mg/kg
Application Route : Ingestion
Exposure time : 7 Weeks

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

Aspiration toxicity

May be fatal if swallowed and enters airways.

Product:

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.

Components:**Distillates (petroleum), solvent-refined light paraffinic:**

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.

12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:****Distillates (petroleum), solvent-refined light paraffinic:**

Toxicity to fish : LL50 (Pimephales promelas (fathead minnow)): > 100 mg/l
Exposure time: 96 h
Test substance: Water Accommodated Fraction

Permethrin / Piperonyl Butoxide FormulationVersion
8.1Revision Date:
2025/04/14SDS Number:
677259-00021Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : LL50 (Daphnia magna (Water flea)): > 10,000 mg/l
Exposure time: 48 h
Test substance: Water Accommodated Fraction

Toxicity to algae/aquatic plants : NOEC (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 10 mg/l

Distillates (petroleum), solvent refined heavy paraffinic:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 10,000 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 10 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211
Remarks: Based on data from similar materials

Toxicity to microorganisms : NOEC: > 1.93 mg/l
Exposure time: 10 min
Method: DIN 38 412 Part 8
Remarks: Based on data from similar materials

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Toxicity to fish : LC50 (Cyprinodon variegatus (sheepshead minnow)): 3.94 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.51 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 3.89 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
		NOEC (Pseudokirchneriella subcapitata (green algae)): 0.824 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 0.18 mg/l Exposure time: 35 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.03 mg/l Exposure time: 21 d
M-Factor (Chronic aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50: > 1,000 mg/l Exposure time: 3 h Method: OECD Test Guideline 209

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
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

Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Toxicity to microorganisms : EC50: > 1,000 mg/l
Exposure time: 3 h

Persistence and degradability**Components:****Distillates (petroleum), solvent-refined light paraffinic:**

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

Distillates (petroleum), solvent refined heavy paraffinic:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 2 - 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Permethrin (ISO):

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

Bioaccumulative potential**Components:****2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:**

Partition coefficient: n-octanol/water : log Pow: 5

Permethrin (ISO):

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

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

Mobility in soil

No data available

Hazardous to the ozone layer

Not applicable

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28 Date of first issue: 2016/05/16

Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

Disposal methods

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

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(Permethrin (ISO), 2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether)
Class : 9
Packing group : III
Labels : 9
Environmentally hazardous : yes

IATA-DGR

UN/ID No. : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.
(Permethrin (ISO), 2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether)
Class : 9
Packing group : III
Labels : Miscellaneous
Packing instruction (cargo aircraft) : 964
Packing instruction (passenger aircraft) : 964
Environmentally hazardous : yes

IMDG-Code

UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(Permethrin (ISO), 2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether)
Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : yes

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

Refer to section 15 for specific national regulation.

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.

ERG Code : 171

15. REGULATORY INFORMATION

Related Regulations

Fire Service Law

Not applicable to dangerous materials / designated flammables.

Chemical Substance Control Law

Not applicable for Specified Chemical Substance, Monitoring Chemical Substance and Priority Assessment Chemical Substance.

Industrial Safety and Health Law

Harmful Substances Prohibited from Manufacture

Not applicable

Harmful Substances Required Permission for Manufacture

Not applicable

Substances Prevented From Impairment of Health

Not applicable

Circular concerning Information on Chemicals having Mutagenicity - Annex 2: Information on Existing Chemicals having Mutagenicity

Not applicable

Circular concerning Information on Chemicals having Mutagenicity - Annex 1: Information on Notified Substances having Mutagenicity

Not applicable

Substances Subject to be Notified Names

Law Article 57-2 (Ministerial Order Article 34-2 Appended Table 2)

Chemical name	Concentration (%)	Remarks
m-phenoxybenzyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	>=1 - <=5	From April 1st, 2026
Mineral oil	>=50 - <=130	-

Substances Subject to be Indicated Names

Law Article 57 (Ministerial Order Article 30 Appended Table 2)

Chemical name	Remarks
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SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28 Date of first issue: 2016/05/16

m-phenoxybenzyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	From April 1st, 2026
Mineral oil	-

Skin and Eye Damage Substances (ISHL MO Art. 594-2)

Not applicable

Carcinogenic Substances (Article 577-2 of the Occupational Health and Safety Regulations)

Not applicable

Ordinance on Prevention of Hazards Due to Specified Chemical Substances

Not applicable

Ordinance on Prevention of Lead Poisoning

Not applicable

Ordinance on Prevention of Tetraalkyl Lead Poisoning

Not applicable

Ordinance on Prevention of Organic Solvent Poisoning

Not applicable

Enforcement Order of the Industrial Safety and Health Law - Attached table 1 (Dangerous Substances)

Not applicable

Poisonous and Deleterious Substances Control Law

Not applicable

Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

Class I Designated Chemical Substances

Chemical name	Administration number	Concentration (%)
3-Phenoxybenzyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	350	5.0

Class II Designated Chemical Substances

Chemical name	Administration number	Concentration (%)
5-Propan-1-yl-6-(2,5,8-trioxadodecan-1-yl)-1,3-benzodioxol	809	5.0

High Pressure Gas Safety Act

Not applicable

Explosive Control Law

Not applicable

Vessel Safety Law

Miscellaneous dangerous substances and articles (Article 2 and 3 of rules on shipping and storage of dangerous goods and its Attached Table 1)

Aviation Law

Miscellaneous dangerous substances and articles (Article 194 of The Enforcement Rules of Aviation Law and its Attached Table 1)

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version 8.1 Revision Date: 2025/04/14 SDS Number: 677259-00021 Date of last issue: 2024/09/28 Date of first issue: 2016/05/16

Marine Pollution and Sea Disaster Prevention etc Law

Bulk transportation : Not classified as noxious liquid substance
Pack transportation : Classified as marine pollutant

Narcotics and Psychotropics Control Act

Narcotic or Psychotropic Raw Material (Export / Import Permission)
Not applicable
Specific Narcotic or Psychotropic Raw Material (Export / Import permission)
Not applicable

Waste Disposal and Public Cleansing Law

Industrial waste

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

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

16. OTHER INFORMATION

In this SDS, if the concentration of substances subject to notification under the Industrial Safety and Health Law is indicated as a range, it includes cases where it is a trade secret.

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/>

Date format : yyyy/mm/dd

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)

ACGIH / TWA : 8-hour, time-weighted average

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 Or-

SAFETY DATA SHEET



Permethrin / Piperonyl Butoxide Formulation

Version
8.1

Revision Date:
2025/04/14

SDS Number:
677259-00021

Date of last issue: 2024/09/28
Date of first issue: 2016/05/16

ganisation 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.

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