

SAFETY DATA SHEET



Fenbendazole Paste Formulation

Version 9.0

Revision Date: 17.06.2025

SDS Number: 887508-00024

Date of last issue: 28.09.2024
Date of first issue: 16.09.2016

Section 1: Identification

Product name : Fenbendazole Paste Formulation

Manufacturer or supplier's details

Company : MSD

Address : 33 Whakatiki Street - Private Bag 908
Upper Hutt - New Zealand

Telephone : 0800 800 543

Emergency telephone number : 0800 764 766 (0800 POISON) 0800 243 622 (0800 CHEMCALL)

E-mail address : EHSDATASTEWARD@msd.com

Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product

Restrictions on use : Not applicable

Section 2: Hazard identification

GHS Classification

Reproductive toxicity : Category 2

Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Liver, Stomach, Nervous system, Lymph nodes)

Hazardous to the aquatic environment - acute hazard : Category 1

Hazardous to the aquatic environment - chronic hazard : Category 1

GHS label elements

Hazard pictograms :



Signal word :

Warning

Hazard statements :

H361fd Suspected of damaging fertility. Suspected of damaging the unborn child.
H373 May cause damage to organs (Liver, Stomach, Nervous system, Lymph nodes) through prolonged or repeated expo-

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sure if swallowed.
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.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

: Response:

P308 + P313 IF exposed or concerned: Get medical advice/ attention.
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

None known.

Section 3: Composition/information on ingredients

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
fenbendazole	43210-67-9	>= 10 -< 20
Propylene glycol	57-55-6	>= 10 -< 20
Glycerine	56-81-5	>= 10 -< 20
Ethanol#	64-17-5	< 0.1
2-Furaldehyde#	98-01-1	>= 0.0025 -< 0.025
Diethyl malonate#	105-53-3	< 0.1
Cinnamaldehyde#	104-55-2	< 0.01
Isovaleraldehyde#	590-86-3	>= 0.0003 -< 0.0025
Trans-hex-2-en-1-ol#	928-95-0	< 0.1
Acetaldehyde#	75-07-0	< 0.1

Voluntarily-disclosed substance

Section 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.

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

In case of skin contact : In case of contact, immediately flush skin with soap and 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.
Get medical attention.
Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed : Suspected of damaging fertility. Suspected of damaging the unborn child.
May cause damage to organs through prolonged or repeated exposure if swallowed.

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).

Notes to physician : Treat symptomatically and supportively.

Section 5: Fire-fighting measures

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical

Unsuitable extinguishing media : None known.

Specific hazards during fire-fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Carbon oxides
Nitrogen oxides (NO_x)
Sulphur oxides

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.

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

Hazchem Code : 3Z

Section 6: Accidental release measures

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Personal precautions, protective equipment and emergency procedures : Use personal protective equipment. Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

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 : 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.

Section 7: Handling and storage

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

Local/Total ventilation : Use only with adequate ventilation.

Advice on safe handling : Do not breathe vapours.
Do not swallow.
Avoid contact with eyes.
Avoid prolonged or repeated contact with skin.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
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.
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 : Keep in properly labelled containers.
Store locked up.

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Materials to avoid : Store in accordance with the particular national regulations.
Do not store with the following product types:
Strong oxidizing agents

Section 8: Exposure controls/personal protection

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parame- ters / Permissible concentration	Basis
fenbendazole	43210-67-9	TWA	100 µg/m3 (OEB 2)	Internal
Propylene glycol	57-55-6	WES-TWA (particulate)	10 mg/m3	NZ OEL
		WES-TWA (Vapour and particulates)	150 ppm 474 mg/m3	NZ OEL
Glycerine	56-81-5	WES-TWA (Mist)	10 mg/m3	NZ OEL
Ethanol	64-17-5	WES-TWA	200 ppm 380 mg/m3	NZ OEL
		Further information: Ototoxin		
		WES-STEL	800 ppm 1,520 mg/m3	NZ OEL
		Further information: Ototoxin		
		STEL	1,000 ppm	ACGIH
2-Furaldehyde	98-01-1	WES-TWA	0.2 ppm 0.8 mg/m3	NZ OEL
		Further information: Suspected human carcinogen, Skin absorp- tion		
		TWA	0.2 ppm	ACGIH
Acetaldehyde	75-07-0	WES-Ceiling	20 ppm 36 mg/m3	NZ OEL
		Further information: Suspected human carcinogen		
		C	25 ppm	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sam- pling time	Permissible concentra- tion	Basis
2-Furaldehyde	98-01-1	Furoic acid	Urine	End of shift (As soon as possible after exposure ceases)	200 mg/l	ACGIH BEI

Engineering measures : Use appropriate engineering controls and manufacturing

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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.

Laboratory operations do not require special containment.

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 : Chemical-resistant gloves

Material : Chemical-resistant gloves

Eye 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 and body protection : Work uniform or laboratory coat.

Section 9: Physical and chemical properties

Appearance : paste

Colour : white to off-white

Odour : cinnamon-like

Odour Threshold : No data available

pH : 6 - 8

Melting point/freezing point : No data available

Initial boiling point and boiling range : No data available

Flash point : No data available

Evaporation rate : No data available

Flammability (solid, gas) : Not applicable

Flammability (liquids) : No data available

Upper explosion limit / Upper flammability limit : No data available

Lower explosion limit / Lower flammability limit : No data available

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flammability limit

Vapour pressure : No data available

Relative vapour density : No data available

Relative density : No data available

Density : No data available

Solubility(ies)

Water solubility : insoluble

Partition coefficient: n-octanol/water : Not applicable

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity

Viscosity, kinematic : 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 : No data available

Section 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.

Section 11: Toxicological information

Exposure routes : Inhalation
Skin contact
Ingestion
Eye contact

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Date of first issue: 16.09.2016**Acute toxicity**

Not classified based on available information.

Components:**fenbendazole:**

Acute oral toxicity	:	LD50 (Rat): > 10,000 mg/kg
		LD50 (Mouse): > 10,000 mg/kg

Propylene glycol:

Acute oral toxicity	:	LD50 (Rat): 22,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 44.9 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

Glycerine:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg
Acute dermal toxicity	:	LD50 (Guinea pig): > 5,000 mg/kg

Ethanol:

Acute oral toxicity	:	LD50 (Rat): 10,470 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	:	LC50 (Rat, male): 116.9 mg/l Exposure time: 4 h Test atmosphere: vapour
Acute dermal toxicity	:	LD50 (Rabbit): > 15,800 mg/kg

2-Furaldehyde:

Acute oral toxicity	:	Acute toxicity estimate: > 5 - 50 mg/kg Method: Expert judgement Remarks: Based on national or regional regulation.
Acute inhalation toxicity	:	LC50 (Rat): 1 mg/l Exposure time: 4 h Test atmosphere: vapour
Acute dermal toxicity	:	Acute toxicity estimate: 300 mg/kg Method: Expert judgement

Diethyl malonate:

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Acute oral toxicity	: LD50 (Rat): > 5,000 mg/kg
Acute dermal toxicity	: LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402 Remarks: Based on data from similar materials

Cinnamaldehyde:

Acute oral toxicity	: LD50 (Rat): 2,200 mg/kg
Acute dermal toxicity	: LD50 (Rabbit): 1,260 mg/kg

Isovaleraldehyde:

Acute oral toxicity	: LD50 (Rat): 5,740 mg/kg
Acute inhalation toxicity	: LC50 (Rat): 42.7 mg/l Exposure time: 4 h Test atmosphere: vapour
Acute dermal toxicity	: LD50 (Rabbit): 2,534 mg/kg

Trans-hex-2-en-1-ol:

Acute oral toxicity	: LD50 (Rat): 3,500 mg/kg
Acute inhalation toxicity	: Assessment: Corrosive to the respiratory tract.
Acute dermal toxicity	: LD50 (Rabbit): 4,500 mg/kg

Acetaldehyde:

Acute oral toxicity	: LD50 (Rat): 661 mg/kg
Acute dermal toxicity	: LD50 (Rabbit): 3,540 mg/kg

Skin corrosion/Irritation

Not classified based on available information.

Components:

fenbendazole:

Species	: Rabbit
Result	: No skin irritation

Propylene glycol:

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

Glycerine:

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Species: : Rabbit
Result: : No skin irritation

Ethanol:

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

2-Furaldehyde:

Species: : Rabbit
Method: : OECD Test Guideline 404
Result: : Mild skin irritation

Diethyl malonate:

Species: : Rabbit
Result: : No skin irritation

Cinnamaldehyde:

Species: : human skin
Result: : Skin irritation

Isovaleraldehyde:

Species: : Rabbit
Method: : OECD Test Guideline 404
Result: : Mild skin irritation

Trans-hex-2-en-1-ol:

Species: : reconstructed human epidermis (RhE)
Method: : OECD Test Guideline 431
Result: : Corrosive after 3 minutes to 1 hour of exposure

Acetaldehyde:

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

Serious eye damage/eye irritation

Not classified based on available information.

Components:

fenbendazole:

Species: : Rabbit
Result: : No eye irritation

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Propylene glycol:

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

Glycerine:

Species	:	Rabbit
Result	:	No eye irritation

Ethanol:

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

2-Furaldehyde:

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

Diethyl malonate:

Species	:	Rabbit
Result	:	Irritation to eyes, reversing within 21 days

Cinnamaldehyde:

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

Isovaleraldehyde:

Species	:	Rabbit
Result	:	Irritation to eyes, reversing within 21 days

Trans-hex-2-en-1-ol:

Result	:	Irreversible effects on the eye
Remarks	:	Based on skin corrosivity.

Acetaldehyde:

Species	:	Rabbit
Result	:	Irritation to eyes, reversing within 21 days

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

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Not classified based on available information.

Components:**Propylene glycol:**

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

Ethanol:

Test Type	:	Mouse ear swelling test (MEST)
Exposure routes	:	Skin contact
Species	:	Mouse
Result	:	negative

2-Furaldehyde:

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

Diethyl malonate:

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

Cinnamaldehyde:

Test Type	:	Maximisation Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Result	:	positive
Assessment	:	Probability or evidence of high skin sensitisation rate in humans

Isovaleraldehyde:

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

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: Probability or evidence of low to moderate skin sensitisation rate in humans

Trans-hex-2-en-1-ol:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	negative
Remarks	:	Based on data from similar materials

Acetaldehyde:

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

Chronic toxicity**Germ cell mutagenicity**

Not classified based on available information.

Components:**fenbendazole:**

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
		Test Type: DNA Repair Result: negative
		Test Type: Chromosomal aberration Result: negative
		Test Type: in vitro assay Test system: mouse lymphoma cells Metabolic activation: Metabolic activation Result: equivocal

Propylene glycol:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
		Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 Result: negative
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo)

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cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Result: negative

Glycerine:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Result: negative

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

Ethanol:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative

Test Type: Chromosome aberration test in vitro
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: Ingestion
Result: negative

2-Furaldehyde:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: positive

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: positive

Test Type: DNA damage and repair, unscheduled DNA syn-

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Diethyl malonate:	Genotoxicity in vitro	thesis in mammalian cells (in vitro) Result: positive
		Test Type: In vitro sister chromatid exchange assay in mammalian cells Result: positive
Genotoxicity in vivo	: Test Type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo Species: Rat Application Route: Ingestion Result: negative	
		Test Type: Transgenic rodent somatic cell gene mutation assay Species: Mouse Application Route: Ingestion Result: negative
Cinnamaldehyde:	Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Method: Directive 67/548/EEC, Annex, B.13/14 Result: negative
		Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	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: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Ingestion Result: negative Remarks: Based on data from similar materials
		Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Intraperitoneal injection Result: negative

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Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)

Species: Mouse

Application Route: Ingestion

Result: negative

Test Type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo

Species: Rat

Application Route: Ingestion

Result: negative

Isovaleraldehyde:

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

Result: positive

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

Trans-hex-2-en-1-ol:

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)

Method: OECD Test Guideline 471

Result: negative

Test Type: in vitro micronucleus test

Method: OECD Test Guideline 487

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

Acetaldehyde:

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)

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	Result: negative
	Test Type: In vitro mammalian cell gene mutation test Result: positive
	Test Type: Chromosome aberration test in vitro Result: positive
	Test Type: in vitro micronucleus test Result: positive
	Test Type: In vitro sister chromatid exchange assay in mammalian cells Result: positive
	Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro) Result: positive
Genotoxicity in vivo	: Test Type: In vivo micronucleus test Species: Rat Application Route: Intraperitoneal injection Result: positive
	Test Type: Mammalian bone marrow sister chromatid exchange Species: Mouse Application Route: Intraperitoneal injection Result: positive
Germ cell mutagenicity - Assessment	: Positive result(s) from in vivo somatic cell mutagenicity tests in mammals. Evidence that the substance has potential to cause mutations to germ cells

Carcinogenicity

Not classified based on available information.

Components:**fenbendazole:**

Species	: Mouse
Application Route	: oral (feed)
Exposure time	: 2 Years
NOAEL	: 405 mg/kg body weight
Result	: negative
Species	: Rat
Application Route	: Oral
Exposure time	: 2 Years
NOAEL	: 5 mg/kg body weight
Result	: negative
Target Organs	: Lymph nodes, Liver

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Propylene glycol:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	2 Years
Result	:	negative

Glycerine:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	2 Years
Result	:	negative

2-Furaldehyde:

Species	:	Mouse
Application Route	:	Ingestion
Exposure time	:	103 weeks
Method	:	OECD Test Guideline 451
Result	:	positive
Remarks	:	The mechanism or mode of action is not relevant in humans.

Species	:	Hamster
Application Route	:	inhalation (vapour)
Exposure time	:	52 weeks
Result	:	negative

Species	:	Mouse
Application Route	:	Skin contact
Exposure time	:	47 weeks
Result	:	positive

Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies
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Cinnamaldehyde:

Species	:	Rat
Application Route	:	Ingestion
Exposure time	:	106 weeks
Result	:	negative
Remarks	:	Based on data from similar materials

Species	:	Mouse
Application Route	:	Intraperitoneal injection
Exposure time	:	24 weeks
Result	:	negative

Isovaleraldehyde:

Species	:	Rat
Application Route	:	inhalation (vapour)
Exposure time	:	2 Years

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Result	:	negative
Remarks	:	Based on data from similar materials

Acetaldehyde:

Species	:	Rat
Application Route	:	Inhalation
Exposure time	:	121 weeks
Result	:	positive
Carcinogenicity - Assessment	:	Sufficient evidence of carcinogenicity in animal experiments

Reproductive toxicity

Suspected of damaging fertility. Suspected of damaging the unborn child.

Components:**fenbendazole:**

Effects on fertility	:	Test Type: Three-generation reproduction toxicity study Species: Rat Application Route: oral (feed) General Toxicity - Parent: NOAEL: 15 mg/kg body weight Fertility: LOAEL: 45 mg/kg body weight Result: Effects on fertility
Effects on foetal development	:	Test Type: Development Species: Dog, female Application Route: Oral Developmental Toxicity: LOAEL: 100 mg/kg body weight Result: Embryotoxic effects and adverse effects on the offspring were detected., No teratogenic effects
	:	Test Type: Embryo-foetal development Species: Rabbit Application Route: Oral Developmental Toxicity: NOAEL: 25 mg/kg body weight Result: Fetotoxicity
	:	Test Type: Embryo-foetal development Species: Rabbit Application Route: Oral Developmental Toxicity: LOAEL: 63 mg/kg body weight
	:	Test Type: Embryo-foetal development Species: Rat Application Route: Oral Developmental Toxicity: NOAEL: 120 mg/kg body weight Result: No effects on foetal development
Reproductive toxicity - Assessment	:	Some evidence of adverse effects on sexual function and fertility, based on animal experiments., Some evidence of adverse effects on development, based on animal experi-

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||| ments.

Propylene glycol:

Effects on fertility	: Test Type: Two-generation reproduction toxicity study Species: Mouse Application Route: Ingestion Result: negative
Effects on foetal development	: Test Type: Embryo-foetal development Species: Mouse Application Route: Ingestion Result: negative

Glycerine:

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 Species: Rat Application Route: Ingestion Result: negative

Ethanol:

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

Effects on foetal development	: Test Type: Embryo-foetal development Species: Rat Application Route: Ingestion Result: negative
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Diethyl malonate:

Effects on fertility	: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: negative Remarks: Based on data from similar materials
Effects on foetal development	: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion

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Method: OECD Test Guideline 422
Result: negative
Remarks: Based on data from similar materials

Cinnamaldehyde:

Effects on foetal development : Test Type: Embryo-foetal development
Species: Mouse
Application Route: Ingestion
Result: negative

Trans-hex-2-en-1-ol:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development

: Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative
Remarks: Based on data from similar materials

Acetaldehyde:

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Result: negative

Reproductive toxicity - Assessment

: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

STOT - single exposure

Not classified based on available information.

Components:

2-Furaldehyde:

Assessment : May cause respiratory irritation.

Isovaleraldehyde:

Assessment : May cause respiratory irritation.

Acetaldehyde:

Assessment : May cause respiratory irritation.

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STOT - repeated exposure

May cause damage to organs (Liver, Stomach, Nervous system, Lymph nodes) through prolonged or repeated exposure if swallowed.

Components:**fenbendazole:**

Exposure routes	:	Ingestion
Target Organs	:	Liver, Stomach, Nervous system, Lymph nodes
Assessment	:	May cause damage to organs through prolonged or repeated exposure.

2-Furaldehyde:

Assessment	:	No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.
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Acetaldehyde:

Assessment	:	May cause damage to organs through prolonged or repeated exposure.
Remarks	:	Based on national or regional regulation.

Repeated dose toxicity**Components:****fenbendazole:**

Species	:	Rat
LOAEL	:	500 mg/kg
Application Route	:	Oral
Exposure time	:	2 Weeks
Target Organs	:	Kidney, Liver

Species	:	Rat
NOAEL	:	> 2,500 mg/kg
Application Route	:	Oral
Exposure time	:	30 Days
Remarks	:	No significant adverse effects were reported

Species	:	Rat
LOAEL	:	1,600 mg/kg
Application Route	:	Oral
Exposure time	:	90 Days
Target Organs	:	Central nervous system
Symptoms	:	Tremors

Species	:	Dog
NOAEL	:	4 mg/kg
LOAEL	:	8 mg/kg
Exposure time	:	6 Months

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||| Target Organs : Stomach, Nervous system, Lymph nodes

Propylene glycol:

||| Species : Rat, male
||| NOAEL : >= 1,700 mg/kg
||| Application Route : Ingestion
||| Exposure time : 2 yr

Glycerine:

||| Species : Rat
||| NOAEL : 0.167 mg/l
||| LOAEL : 0.622 mg/l
||| Application Route : inhalation (dust/mist/fume)
||| Exposure time : 13 Weeks

||| Species : Rat
||| NOAEL : 8,000 - 10,000 mg/kg
||| Application Route : Ingestion
||| Exposure time : 2 yr

||| Species : Rabbit
||| NOAEL : 5,040 mg/kg
||| Application Route : Skin contact
||| Exposure time : 45 Weeks

Ethanol:

||| Species : Rat
||| NOAEL : 1,730 mg/kg
||| LOAEL : 3,200 mg/kg
||| Application Route : Ingestion
||| Exposure time : 90 Days

2-Furaldehyde:

||| Species : Rat
||| NOAEL : 53 mg/kg
||| Application Route : Ingestion
||| Exposure time : 13 Weeks

Cinnamaldehyde:

||| Species : Rat
||| NOAEL : 200 mg/kg
||| Application Route : Ingestion
||| Exposure time : 12 Weeks

Trans-hex-2-en-1-ol:

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Species	:	Rat
NOAEL	:	> 100 mg/kg
Application Route	:	Ingestion
Exposure time	:	98 Days
Remarks	:	Based on data from similar materials

Acetaldehyde:

Species	:	Rat
NOAEL	:	125 mg/kg
LOAEL	:	675 mg/kg
Application Route	:	Ingestion
Exposure time	:	28 Days

Species	:	Rat
NOAEL	:	0.3 mg/kg
LOAEL	:	1 mg/kg
Application Route	:	inhalation (vapour)
Exposure time	:	13 Weeks

Aspiration toxicity

Not classified based on available information.

Components:**fenbendazole:**

||| No aspiration toxicity classification

Experience with human exposure**Components:****fenbendazole:**

||| Ingestion : Symptoms: Rapid respiration, Salivation, anorexia, Diarrhoea

Section 12: Ecological information**Ecotoxicity****Components:****fenbendazole:**

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.009 mg/l Exposure time: 21 d
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.0088 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
M-Factor (Acute aquatic toxicity)	:	100
Toxicity to daphnia and other	:	NOEC (Daphnia magna (Water flea)): 0.00113 mg/l

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aquatic invertebrates (Chronic toxicity) Exposure time: 21 Days
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : 10

Propylene glycol:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 40,613 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (water flea)): 18,340 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (Skeletonema costatum (marine diatom)): 19,300 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Ceriodaphnia dubia (water flea)): 13,020 mg/l
Exposure time: 7 d

Toxicity to microorganisms : NOEC (Pseudomonas putida): > 20,000 mg/l
Exposure time: 18 h

Glycerine:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 54,000 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1,955 mg/l
Exposure time: 48 h

Toxicity to microorganisms : NOEC (Pseudomonas putida): > 10,000 mg/l
Exposure time: 16 h
Method: DIN 38 412 Part 8

Ethanol:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 14,200 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (water flea)): 5,012 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (Chlorella vulgaris (Fresh water algae)): 275 mg/l
Exposure time: 72 h
EC10 (Chlorella vulgaris (Fresh water algae)): 11.5 mg/l
Exposure time: 72 h

Toxicity to fish (Chronic toxicity) : NOEC (Oryzias latipes (Japanese medaka)): >= 79 mg/l
Exposure time: 100 d

Toxicity to daphnia and other : NOEC (Daphnia magna (Water flea)): 9.6 mg/l

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aquatic invertebrates (Chronic toxicity) Exposure time: 9 d

Toxicity to microorganisms : EC50 (Protozoa): 5,800 mg/l
Exposure time: 4 h

2-Furaldehyde:

Toxicity to fish : EC50 (Leuciscus idus (Golden orfe)): 29 mg/l
Exposure time: 48 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 29 mg/l
Exposure time: 24 h

Toxicity to algae/aquatic plants : NOEC (Microcystis aeruginosa (blue-green algae)): 2.7 mg/l
Exposure time: 8 d

Toxicity to fish (Chronic toxicity) : NOEC (Danio rerio (zebra fish)): 0.33 mg/l
Exposure time: 12 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 1.9 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

Toxicity to microorganisms : EC50: 760 mg/l
Exposure time: 30 min
Method: OECD Test Guideline 209

Diethyl malonate:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 12 - 17 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 179 mg/l
Exposure time: 48 h
Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 800 mg/l
Exposure time: 72 h
EC10 (Desmodesmus subspicatus (green algae)): 115 mg/l
Exposure time: 72 h

Toxicity to microorganisms : EC50 (Pseudomonas putida): 3,097 mg/l
Exposure time: 16 h
Method: DIN 38 412 Part 8

Cinnamaldehyde:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 4.15 mg/l
Exposure time: 96 h
Method: Directive 67/548/EEC, Annex V, C.1.

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 3.21 mg/l

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aquatic invertebrates	Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	: ErC50 (Chlorella vulgaris (Fresh water algae)): 16.09 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to microorganisms	: EC50: 71 mg/l Exposure time: 3 h Method: ISO 8192
Isovaleraldehyde:	
Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): 3.25 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 177 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	: ErC50 (Desmodesmus subspicatus (green algae)): 137.37 mg/l Exposure time: 96 h EC10 (Desmodesmus subspicatus (green algae)): 101.83 mg/l Exposure time: 96 h
Toxicity to microorganisms	: EC10 (Pseudomonas putida): 310 mg/l Exposure time: 17 h Method: DIN 38 412 Part 8
Trans-hex-2-en-1-ol:	
Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): > 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)): 163 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	: ErC50 (Pseudokirchneriella subcapitata (green algae)): 226 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Acetaldehyde:	
Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): 30.8 mg/l Exposure time: 96 h
Toxicity to daphnia and other	: EC50 (Daphnia magna (Water flea)): 57.4 mg/l

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aquatic invertebrates	Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	: ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
	EC10 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201

Persistence and degradability**Components:****Propylene glycol:**

Biodegradability	: Result: Readily biodegradable. Biodegradation: 98.3 % Exposure time: 28 d Method: OECD Test Guideline 301F
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Glycerine:

Biodegradability	: Result: Readily biodegradable. Biodegradation: 92 % Exposure time: 30 d Method: OECD Test Guideline 301D
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Ethanol:

Biodegradability	: Result: Readily biodegradable. Biodegradation: 84 % Exposure time: 20 d
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2-Furaldehyde:

Biodegradability	: Result: Readily biodegradable. Biodegradation: 93.5 % Exposure time: 14 d
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Diethyl malonate:

Biodegradability	: Result: Readily biodegradable. Biodegradation: 99 % Exposure time: 28 d Method: Regulation (EC) No. 440/2008, Annex, C.4-A
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Cinnamaldehyde:

Biodegradability	: Result: Readily biodegradable. Biodegradation: 100 %
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Exposure time: 28 d
Method: OECD Test Guideline 301B

Isovaleraldehyde:

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 49.5 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Trans-hex-2-en-1-ol:

Biodegradability : Result: Readily biodegradable.
Remarks: Based on data from similar materials

Acetaldehyde:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 80 %
Exposure time: 14 d
Method: OECD Test Guideline 301C

Bioaccumulative potential**Components:****fenbendazole:**

Partition coefficient: n-octanol/water : log Pow: 3.32

Propylene glycol:

Partition coefficient: n-octanol/water : log Pow: -1.07
Method: Regulation (EC) No. 440/2008, Annex, A.8

Glycerine:

Partition coefficient: n-octanol/water : log Pow: -1.75

Ethanol:

Partition coefficient: n-octanol/water : log Pow: -0.35

2-Furaldehyde:

Partition coefficient: n-octanol/water : log Pow: 0.83
Remarks: Calculation

Diethyl malonate:

Partition coefficient: n-octanol/water : log Pow: 0.96

Cinnamaldehyde:

Partition coefficient: n- : log Pow: 2.107

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||| octanol/water

Isovaleraldehyde:

||| Partition coefficient: n-octanol/water : log Pow: 1.5

Trans-hex-2-en-1-ol:

||| Partition coefficient: n-octanol/water : log Pow: 1.61
Remarks: Calculation

Acetaldehyde:

||| Partition coefficient: n-octanol/water : log Pow: 0.45

Mobility in soil

Components:

fenbendazole:

||| Distribution among environmental compartments : log Koc: 3.8 - 4.7
Method: FDA 3.08

Ethanol:

||| Distribution among environmental compartments : log Koc: 0.2

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.
If not otherwise specified: Dispose of as unused product.

Section 14: Transport information

International Regulations

UNRTDG

UN number : UN 3082

Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(fenbendazole)

Class : 9

Packing group : III

Labels : 9

Environmentally hazardous : yes

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IATA-DGR

UN/ID No. : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.
(fenbendazole)
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.
(fenbendazole)
Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : yes

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

Not applicable for product as supplied.

National Regulations

NZS 5433

UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
N.O.S.
(fenbendazole)
Class : 9
Packing group : III
Labels : 9
Hazchem Code : 3Z
Marine pollutant : no

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.

Section 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

HSNO Approval Number

HSR100759 Veterinary Medicines Non dispersive Open System Application Group Standard

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Tolerable Exposure Limits (TEL)

Not applicable

Environmental Exposure Limits (EEL)

Not applicable

HSW Controls

Certified handler certificate not required.

Tracking hazardous substance not required.

Refer to the Health and Safety at Work (Hazardous Substances) Regulations 2017, for further information.

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

AICS : not determined

DSL : not determined

IECSC : not determined

Section 16: Other information

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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)
ACGIH BEI	: ACGIH - Biological Exposure Indices (BEI)
NZ OEL	: New Zealand. Workplace Exposure Standards for Atmospheric Contaminants
ACGIH / TWA	: 8-hour, time-weighted average
ACGIH / STEL	: Short-term exposure limit
ACGIH / C	: Ceiling limit
NZ OEL / WES-TWA	: Workplace Exposure Standard - Time Weighted average
NZ OEL / WES-STEL	: Workplace Exposure Standard - Short-Term Exposure Limit
NZ OEL / WES-Ceiling	: Workplace Exposure Standard - Ceiling

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

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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; KECL - 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.

NZ / EN