SAFETY DATA SHEET

ZORO® 36 EC

Version	Revision Date:	SDS Number:	Date of last issue: -
2.0	09.03.2022	50000780	Date of first issue: 19.02.2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name ZORO® 36 EC

Other means of identification

Product code 50000780

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Insecticide

Recommended restrictions on use : Use as recommended by the label.

1.3 Details of the supplier of the safety data sheet

Supplier Address

FMC Chemicals (Pty) Ltd
Company Registration Number: 1988/001451/07
West End Office Park, Building C
Cnr. West Ave & Hall Street
Centurion, 0014

E-mail address: SDS-Info@fmc.com (E-Mail General Information)

1.4 Emergency telephone

For leak, fire, spill or accident emergencies, call:
South Africa: 0-800-983-611 (CHEMTREC)

Medical emergency:
For any emergency or poisoning contact: Griffon Poison Information Centre (24 hrs) - +27-(0)-82-446-8946

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4	H302: Harmful if swallowed.
Acute toxicity, Category 4	H332: Harmful if inhaled.

Reproductive toxicity, Category 1B	H360D: May damage the unborn child.
Specific target organ toxicity - single exposure, Category 3, Respiratory system	H335: May cause respiratory irritation.
Specific target organ toxicity - repeated exposure, Category 2	H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, Category 1	H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, Category 1	H410: Very toxic to aquatic life with long lasting effects.

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal Word : Danger

Hazard Statements :
H302 + H332 Harmful if swallowed or if inhaled.
H335 May cause respiratory irritation.
H360D May damage the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements :

Prevention:

P201 Obtain special instructions before use.
P260 Do not breathe mist or vapors.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P391 Collect spillage.

Hazardous ingredients which must be listed on the label:

hexan-1-ol
1-methyl-2-pyrrolidone
abamectin (combination of avermectin B1a and avermectin B1b) (ISO)

Additional Labeling

Restricted to professional users.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
hexan-1-ol	111-27-3 203-852-3 603-059-00-6	Flam. Liq. 3; H226 Acute Tox. 4; H302 Acute Tox. 4; H312 Eye Irrit. 2; H319	>= 20 - < 30
1-methyl-2-pyrrolidone	872-50-4 212-828-1 606-021-00-7	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Repr. 1B; H360D STOT SE 3; H335 (Respiratory system)	>= 20 - < 30
abamectin (combination of avermectin B1a and avermectin B1b) (ISO)	71751-41-2 606-143-00-0	Acute Tox. 2; H300 Acute Tox. 1; H330 Repr. 2; H361d STOT RE 1; H372 (Nervous system) Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor (Acute aquatic toxicity): 10,000 M-Factor (Chronic aquatic toxicity): 10,000	>= 3 - < 5
cyclohexane	110-82-7 203-806-2 601-017-00-1	Flam. Liq. 2; H225 Skin Irrit. 2; H315 STOT SE 3; H336 (Central nervous system) Asp. Tox. 1; H304 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor (Acute aquatic toxicity): 1	>= 0.25 - < 1
2,6-di-tert-butyl-p-cresol	128-37-0	Aquatic Acute 1;	>= 0.25 - < 1

	204-881-4	H400 Aquatic Chronic 1; H410 M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 1	

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Flush eyes with water as a precaution.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Induce vomiting immediately and call a physician.
Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Risks : Harmful if swallowed or if inhaled.
May cause respiratory irritation.
May damage the unborn child.
May cause damage to organs through prolonged or repeated exposure.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Dry chemical, CO2, water spray or regular foam.

Unsuitable extinguishing media : Do not spread spilled material with high-pressure water streams.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Hazardous combustion products
Carbon oxides

5.3 Advice for firefighters

Special protective equipment for fire-fighters : Firefighters should wear protective clothing and self-contained breathing apparatus.

Specific extinguishing methods : Remove undamaged containers from fire area if it is safe to do so.
Use a water spray to cool fully closed containers.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Standard procedure for chemical fires.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Evacuate personnel to safe areas.
Use personal protective equipment.
If it can be safely done, stop the leak.
Do not touch or walk through the spilled material.
Never return spills in original containers for re-use.
For disposal considerations see section 13.

6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid formation of aerosol.
Do not breathe vapors/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material.
Keep away from open flames, hot surfaces and sources of ignition.

Normal measures for preventive fire protection.

Hygiene measures : When using do not eat or drink. When using do not smoke.
Wash hands before breaks and at the end of workday.

General industrial hygiene practice. Avoid contact with skin, eyes and clothing. Do not inhale aerosol.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

Further information on storage stability : No decomposition if stored and applied as directed.

7.3 Specific end use(s)

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
1-methyl-2-pyrrolidone	872-50-4	TWA	10 ppm 40 mg/m3	2009/161/EU
		STEL	20 ppm 80 mg/m3	2009/161/EU
cyclohexane	110-82-7	OEL-RL	200 ppm	ZA OEL
Further information	Occupational Exposure Limits - Restricted Limits For Hazardous Chemical Agents			
		TWA	200 ppm 700 mg/m3	2006/15/EC
2,6-di-tert-butyl-p-cresol	128-37-0	OEL-RL	10 mg/m3	ZA OEL
Further information	Occupational Exposure Limits - Restricted Limits For Hazardous Chemical Agents			

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Routes of exposure	Potential health effects	Value
hexan-1-ol	Workers	Inhalation	Long-term systemic effects	99 mg/m3
	Workers	Dermal	Long-term systemic effects	28 mg/kg bw/day
	Workers	Dermal	Long-term local effects	0.19 mg/m3
	Consumers	Inhalation	Long-term systemic effects	24.5 mg/m3
	Consumers	Dermal	Long-term systemic effects	14 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	14 mg/kg bw/day
1-methyl-2-pyrrolidone	Workers	Inhalation	Long-term systemic effects	14.4 mg/m3
	Workers	Inhalation	Long-term local effects	40 mg/m3
	Workers	Dermal	Long-term systemic effects	4.8 mg/m3
	Consumers	Inhalation	Long-term systemic effects	3.6 mg/m3
	Consumers	Inhalation	Long-term local effects	4.5 mg/m3
	Consumers	Dermal	Long-term systemic effects	2.4 mg/kg
	Consumers	Oral	Long-term systemic effects	0.85 mg/kg
Castor oil. hydrogen-	Workers	Dermal	Long-term systemic	16.6 mg/kg

ated, ethoxylated			effects	bw/day
	Consumers	Dermal	Long-term systemic effects	8.3 mg/kg bw/day
abamectin (combination of avermectin B1a and avermectin B1b) (ISO)				0.0025 mg/kg
cyclohexane	Workers	Inhalation	Long-term systemic effects	700 mg/m3
	Workers	Inhalation	Acute systemic effects	1400 mg/m3
	Workers	Inhalation	Long-term local effects	700 mg/m3
	Workers	Inhalation	Acute local effects	1400 mg/m3
	Workers	Dermal	Long-term systemic effects	2016 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	206 mg/m3
	Consumers	Inhalation	Acute systemic effects	412 mg/m3
	Consumers	Inhalation	Long-term local effects	206 mg/m3
	Consumers	Inhalation	Acute local effects	412 mg/m3
	Consumers	Dermal	Long-term systemic effects	1186 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	59.4 mg/kg bw/day
2,6-di-tert-butyl-p-cresol	Workers	Inhalation	Long-term systemic effects	3.5 mg/m3
	Workers	Dermal	Long-term systemic effects	0.5 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0.86 mg/m3
	Consumers	Dermal	Long-term systemic effects	0.250 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
hexan-1-ol	Fresh water	0.51 mg/l
	Intermittent use/release	4 mg/l
	Sea water	0.051 mg/l
	Sewage treatment plant	62 mg/l
	Fresh water sediment	2.8 mg/kg
	Sea sediment	0.280 mg/kg
	Soil	0.25 mg/kg
1-methyl-2-pyrrolidone	Fresh water	0.25 mg/l
	Intermittent use/release	5 mg/l
	Sea water	0.025 mg/l
	Sewage treatment plant	10 mg/l
	Fresh water sediment	1.09 mg/kg
	Sea sediment	0.00109 mg/kg
Castor oil. hydrogenated, ethoxylated	Fresh water	0.001 mg/l
	Sea water	100 ng/l

	Fresh water sediment	100 mg/kg dry weight (d.w.)
	Sea sediment	10 mg/kg dry weight (d.w.)
	Soil	20 mg/kg dry weight (d.w.)
	Intermittent use (freshwater)	0.01 mg/l
Sorbitan monolaurate, ethoxylated	Fresh water	0.2 mg/l
	Sea water	0.02 mg/l
	Fresh water sediment	1.141 mg/kg dry weight (d.w.)
	Sea sediment	1000 mg/kg dry weight (d.w.)
	Intermittent use (freshwater)	0.239 mg/l
abamectin (combination of avermectin B1a and avermectin B1b) (ISO)	Fresh water	0.35 ng/l
cyclohexane	Fresh water	0.207 mg/l
	Sea water	0.207 mg/l
	Intermittent use (freshwater)	0.207 mg/l
	Sewage treatment plant	3.24 mg/l
	Fresh water sediment	16.68 mg/kg dry weight (d.w.)
	Sea sediment	16.68 mg/kg dry weight (d.w.)
	Soil	3.38 mg/kg dry weight (d.w.)
2,6-di-tert-butyl-p-cresol	Fresh water	199 ng/l
	Sea water	19.9 ng/l
	Fresh water sediment	0.0996 mg/kg dry weight (d.w.)
	Sea sediment	0.00996 mg/kg dry weight (d.w.)
	Soil	0.04769 mg/kg dry weight (d.w.)
	Intermittent use (freshwater)	1.99 µg/l
	Sewage treatment plant	170 µg/l
	Oral	8.33 mg/kg

8.2 Exposure controls

Personal protective equipment

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles

Hand protection
Material : Protective gloves

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

		Protective suit
Respiratory protection	:	In the case of dust or aerosol formation use respirator with an approved filter.
Protective measures	:	Plan first aid action before beginning work with this product.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	liquid
Color	:	yellow
Odor	:	amine-like
Odor Threshold	:	No data available
pH	:	7.12 (20 °C)
Melting point/range	:	No data available
Boiling point/boiling range	:	No data available
Flash point	:	73 °C Method: Pensky-Martens closed cup
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Density	:	966 g/l (20 °C)
Solubility(ies)		
Water solubility	:	dispersible
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	60 °C
		No data available
Viscosity		
Viscosity, dynamic	:	23.5 mPa.s (20 °C)

Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	Non-oxidizing

9.2 Other information

Self-ignition	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	No decomposition if stored and applied as directed. Vapors may form explosive mixture with air.

10.4 Conditions to avoid

Conditions to avoid	:	Heat, flames and sparks. Avoid extreme temperatures Avoid formation of aerosol.

10.5 Incompatible materials

Materials to avoid	:	Avoid strong acids, bases, and oxidizers.

10.6 Hazardous decomposition products

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Harmful if swallowed or if inhaled.

Product:

Acute oral toxicity	:	LD50 (Rat): 400 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	:	LC50 (Rat): > 4.96 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Assessment: The component/mixture is moderately toxic after short term inhalation.

Remarks: Evident toxicity

Acute dermal toxicity : LD50 (Rat): > 4,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The component/mixture is minimally toxic after single contact with skin.

Components:

hexan-1-ol:

Acute oral toxicity : LD50 (Rat, male and female): 3,210 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC0 (Rat, male and female): > 21 mg/l
Exposure time: 1 h
Test atmosphere: dust/mist
Symptoms: ataxia
Remarks: no mortality

Acute dermal toxicity : LD50 (Rabbit, male and female): 1,500 - 2,000 mg/kg
Method: OECD Test Guideline 402

1-methyl-2-pyrrolidone:

Acute oral toxicity : LD50 (Rat): 4,150 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC0 (Rat): > 5.1 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity

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

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Acute oral toxicity : LD50 (Rat): 340 mg/kg
Method: OECD Test Guideline 425

Acute inhalation toxicity : LC50 (Rat, female): 0.074 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

LC50 (Rat, male): 0.052 - 0.54 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

cyclohexane:

Acute oral toxicity : LD0 (Rat, male and female): > 5,000 mg/kg
Remarks: no mortality

Acute inhalation toxicity : LC0 (Rat, male and female): > 19.07 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Remarks: no mortality

Acute dermal toxicity : LD0 (Rabbit, male and female): > 2,000 mg/kg
Remarks: no mortality

2,6-di-tert-butyl-p-cresol:

Acute oral toxicity : LD50 (Rat, male and female): > 6,000 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC0 (Mouse, male): 0.546 mg/l
Exposure time: 30 min
Test atmosphere: vapor
Remarks: no mortality

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Remarks: no mortality

Skin corrosion/irritation

Not classified based on available information.

Product:

Assessment : No skin irritation
Method : OECD Test Guideline 404
Result : No skin irritation

Components:

hexan-1-ol:

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

1-methyl-2-pyrrolidone:

Species : Rabbit
Method : OECD Test Guideline 404
Result : irritating

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Method : OECD Test Guideline 404
Result : slight irritation

cyclohexane:

Result : Skin irritation

Species : Rabbit
Result : No skin irritation

2,6-di-tert-butyl-p-cresol:

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

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Assessment : No eye irritation
Method : OECD Test Guideline 405
Result : No eye irritation

Remarks : Vapors may cause irritation to the eyes, respiratory system and the skin.

Components:

hexan-1-ol:

Species : Rabbit
Method : OECD Test Guideline 405
Result : Moderate eye irritation

1-methyl-2-pyrrolidone:

Species : Rabbit
Method : OECD Test Guideline 405
Result : irritating

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Method : OECD Test Guideline 405
Result : slight irritation

cyclohexane:

Species : Rabbit
Result : slight irritation

2,6-di-tert-butyl-p-cresol:

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

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Product:

Assessment	:	Did not cause sensitization on laboratory animals.
Method	:	OECD Test Guideline 406
Result	:	Not a skin sensitizer.

Components:

hexan-1-ol:

Test Type	:	Draize Test
Species	:	Guinea pig
Result	:	Does not cause skin sensitization.

1-methyl-2-pyrrolidone:

Method	:	OECD Test Guideline 429
Result	:	Not a skin sensitizer.

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Method	:	OECD Test Guideline 406
Result	:	Not a skin sensitizer.

cyclohexane:

Test Type	:	Buehler Test
Species	:	Guinea pig
Result	:	Does not cause skin sensitization.

2,6-di-tert-butyl-p-cresol:

Test Type	:	Patch test
Species	:	Humans
Result	:	Does not cause skin sensitization.

Germ cell mutagenicity

Not classified based on available information.

Components:

hexan-1-ol:

Genotoxicity in vitro	:	Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	:	Test Type: In vivo micronucleus test Species: Mouse Application Route: Oral Method: OECD Test Guideline 474 Result: negative Remarks: Based on data from similar materials

1-methyl-2-pyrrolidone:

Genotoxicity in vitro	:	Test Type: Ames test 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: unscheduled DNA synthesis assay Result: negative
Genotoxicity in vivo	:	Test Type: Micronucleus test Species: Mouse Method: OECD Test Guideline 474 Result: negative

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Germ cell mutagenicity- Assessment	:	No genotoxic potential

cyclohexane:

Genotoxicity in vitro	:	Test Type: In vitro mammalian cell gene mutation test Result: negative Test Type: reverse mutation assay Result: negative
Genotoxicity in vivo	:	Test Type: Chromosome aberration test in vitro Species: Rat (male and female) Application Route: inhalation (vapor) Result: negative
Germ cell mutagenicity- Assessment	:	Weight of evidence does not support classification as a germ cell mutagen.

2,6-di-tert-butyl-p-cresol:

Genotoxicity in vitro	:	Test Type: reverse mutation assay Result: negative Test Type: In vitro mammalian cell gene mutation test Result: negative Test Type: Chromosome aberration test in vitro Result: negative
Genotoxicity in vivo	:	Test Type: Micronucleus test Species: Mouse (male and female) Application Route: Intraperitoneal injection Result: negative Test Type: chromosome aberration assay Species: Rat (male)

Application Route: Oral
Result: negative

Germ cell mutagenicity- Assessment : Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity

Not classified based on available information.

Components:

1-methyl-2-pyrrolidone:

Species	:	Rat, male and female
Application Route	:	Oral
NOAEL	:	207 - 283 mg/kg bw/day
Result	:	negative
Species	:	Rat, male
Application Route	:	Inhalation
	:	0.04 mg/l
Result	:	negative
Species	:	Mouse, male
Application Route	:	Oral
NOAEL	:	89 mg/kg body weight
Method	:	OECD Test Guideline 451
Result	:	negative

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Carcinogenicity - Assessment	:	Weight of evidence does not support classification as a carcinogen

2,6-di-tert-butyl-p-cresol:

Species	:	Rat, male
Application Route	:	Oral
Exposure time	:	22 months
Dose	:	0, 25, 100, 250 mg/kg bw/day
	:	100 mg/kg bw/day
Result	:	negative
Carcinogenicity - Assessment	:	Weight of evidence does not support classification as a carcinogen

Reproductive toxicity

May damage the unborn child.

Product:

Reproductive toxicity - Assessment	:	Clear evidence of adverse effects on development, based on animal experiments.

Components:

1-methyl-2-pyrrolidone:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: positive

Effects on fetal development : Test Type: Pre-natal
Species: Rat
Application Route: Oral
Method: OECD Test Guideline 414
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

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

cyclohexane:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: inhalation (vapor)
Dose: 0, 1.72, 6.88, 24.08 mg/L
General Toxicity Parent: NOAEC: 1.72 - 6.88 mg/l
General Toxicity F1: NOAEC: 24.08 mg/l
General Toxicity F2: NOAEC: 24.08 mg/l
Result: negative

Effects on fetal development : Test Type: reproductive and developmental toxicity study
Species: Rat
Application Route: inhalation (vapor)
Dose: 0, 1.72, 6.88, 24.08 mg/L
General Toxicity Maternal: NOAEC: 1.72 - 6.88 mg/L
Developmental Toxicity: NOAEC: 24.08 mg/L
Embryo-fetal toxicity.: NOAEC Mating/Fertility: 24.08 mg/L
Result: negative

Reproductive toxicity - Assessment : Weight of evidence does not support classification for reproductive toxicity

2,6-di-tert-butyl-p-cresol:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 0, 25, 100, 500mg/kg/bw/day
General Toxicity Parent: NOAEL: 500 mg/kg bw/day
General Toxicity F1: LOAEL: 25 mg/kg bw/day
Result: negative

Effects on fetal development	:	Test Type: Two-generation study Species: Rat Application Route: Oral Dose: 25, 100, 500mg/kg/bw/day General Toxicity Maternal: LOAEL: 500 mg/kg bw/day Developmental Toxicity: LOAEL: 500 mg/kg bw/day Result: negative Test Type: Developmental Toxicity Screening Test Species: Mouse Application Route: Oral General Toxicity Maternal: LOAEL: 800 mg/kg bw/day Developmental Toxicity: LOAEL: 800 mg/kg bw/day Result: negative
Reproductive toxicity - Assessment	:	Weight of evidence does not support classification for reproductive toxicity

STOT-single exposure

May cause respiratory irritation.

Product:

Assessment	:	May cause respiratory irritation.

Components:

1-methyl-2-pyrrolidone:

Assessment	:	May cause respiratory irritation.

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Remarks	:	No significant adverse effects were reported

cyclohexane:

Assessment	:	May cause drowsiness or dizziness.

STOT-repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Product:

Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Components:

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Target Organs	:	Nervous system
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

2,6-di-tert-butyl-p-cresol:

Assessment	:	The substance or mixture is not classified as specific target

organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

hexan-1-ol:

Species	:	Rat
NOAEL	:	1,127 - 1,243 mg/kg
Application Route	:	Oral
Exposure time	:	13 weeks

1-methyl-2-pyrrolidone:

Species	:	Rat, male
NOAEL	:	169 mg/kg
Application Route	:	Oral
Species	:	Mouse, male
NOAEL	:	89 mg/kg
Application Route	:	Oral
Method	:	OECD Test Guideline 408
Target Organs	:	Liver
Species	:	Rabbit
NOAEL	:	826 mg/kg
Application Route	:	Dermal
Species	:	Rat, male
	:	3 mg/l
Application Route	:	inhalation (vapor)
Target Organs	:	Testes

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Species	:	Dog
	:	0.5 mg/kg
Application Route	:	Oral
Exposure time	:	18 weeks
Method	:	OECD Test Guideline 409
Species	:	Rat
	:	0.0027 mg/l
Application Route	:	Inhalation
Exposure time	:	30 d

cyclohexane:

Species	:	Rat, male and female
NOAEL	:	24,080 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	vapor
Exposure time	:	90 d
Dose	:	1720, 6884.25, 24,080 mg/m3
Method	:	OPPTS 870.3465

2,6-di-tert-butyl-p-cresol:

Species	:	Pig, male and female
NOAEL	:	>= 61 mg/kg bw/day
Application Route	:	Oral
Exposure time	:	42 d

Species	:	Mouse, female
Application Route	:	Dermal
Exposure time	:	4 weeks
Dose	:	0, 208, 415, 830, 1245 mg/kg

Species	:	Mouse, male
Application Route	:	Dermal
Exposure time	:	4 weeks
Dose	:	0, 145, 289, 578 or 867 mg/kg

Aspiration toxicity

Not classified based on available information.

Components:

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

No aspiration toxicity classification

cyclohexane:

May be fatal if swallowed and enters airways.

Further information

Product:

Remarks	:	No data available

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): 0.4 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 5.58 µg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	IC50 (Selenastrum capricornutum (green algae)): 41.43 mg/l Exposure time: 72 h
Toxicity to soil dwelling organisms	:	LC50: 1,250 mg/kg Exposure time: 14 d Species: Eisenia fetida (earthworms)

Toxicity to terrestrial organisms	:	LD50: > 2,000 mg/kg Species: Coturnix japonica (Japanese quail) LC50: 0.15 Exposure time: 48 h Species: Apis mellifera (bees) Remarks: Contact

Components:

hexan-1-ol:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 97.2 - 97.5 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 201 mg/l Exposure time: 24 h
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 79.7 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to microorganisms	:	NOEC (Pseudomonas putida): 62 mg/l Exposure time: 16 h
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 6.8 - 13 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Remarks: Based on data from similar materials

1-methyl-2-pyrrolidone:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 500 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1,000 mg/l Exposure time: 24 h LC50 (Palaeomonetes vulgaris (Grass shrimp)): 1,107 mg/l Exposure time: 96 h
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): 600.5 mg/l Exposure time: 72 h
Toxicity to microorganisms	:	EC50 (activated sludge): 100 mg/l Exposure time: 48 h EC50 (activated sludge): > 600 mg/l Exposure time: 30 min
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 12.5 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Method: OECD Test Guideline 211

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): 0.034 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1.1 µg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	EC50 (Scenedesmus capricornutum (fresh water algae)): 70 mg/l Exposure time: 72 h
M-Factor (Acute aquatic toxicity)	:	10,000
M-Factor (Chronic aquatic toxicity)	:	10,000
Toxicity to soil dwelling organisms	:	LC50: 16 mg/kg Exposure time: 14 d Species: Eisenia fetida (earthworms)
Toxicity to terrestrial organisms	:	LD50: 0.00083 µg/bee Exposure time: 48 h Species: Apis mellifera (bees) LD50: > 2,000 mg/kg Species: Coturnix japonica (Japanese quail)

cyclohexane:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 4.53 mg/l Exposure time: 96 h Test Type: flow-through test
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.9 mg/l Exposure time: 48 h Test Type: static test
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 3.428 mg/l Exposure time: 72 h Test Type: Growth inhibition NOEC (Pseudokirchneriella subcapitata (green algae)): 0.952 mg/l Exposure time: 72 h Test Type: Growth inhibition
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to microorganisms	:	IC50 (Bacteria): 29 mg/l Exposure time: 15 h Test Type: Respiration inhibition

Toxicity to soil dwelling organisms	:	LC50: > 1 mg/cm2 Exposure time: 48 h Species: Eisenia fetida (earthworms)

2,6-di-tert-butyl-p-cresol:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): > 0.57 mg/l Exposure time: 96 h Test Type: semi-static test
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.48 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): > 0.4 mg/l Exposure time: 72 h Method: EU Method C3
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50 (activated sludge): > 10,000 mg/l Exposure time: 3 h Test Type: Respiration inhibition
Toxicity to fish (Chronic toxicity)	:	LOEC: 0.14 mg/l Exposure time: 30 d Species: Oryzias latipes (Japanese medaka) Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0.069 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Method: OECD Test Guideline 211
M-Factor (Chronic aquatic toxicity)	:	1
Toxicity to soil dwelling organisms	:	NOEC: >= 100 mg/kg Exposure time: 28 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222 EC50: 87.9 mg/kg Exposure time: 56 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222 NOEC: 25 mg/kg Exposure time: 56 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222
Toxicity to terrestrial organ-	:	NOEC: >= 268.1 mg/kg

isms — Exposure time: 35 d
Species: Birds

12.2 Persistence and degradability

Components:

hexan-1-ol:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 61 - 77 %
Exposure time: 30 d
Method: OECD Test Guideline 301D

1-methyl-2-pyrrolidone:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 73 %
Exposure time: 28 d

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Biodegradability : Result: Not readily biodegradable.
Remarks: It undergoes degradation in the environment and in waste water treatment plants.

cyclohexane:

Biodegradability : Inoculum: activated sludge, non-adapted
Result: Readily biodegradable.
Biodegradation: 77 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

2,6-di-tert-butyl-p-cresol:

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.

12.3 Bioaccumulative potential

Components:

hexan-1-ol:

Partition coefficient: n-octanol/water : log Pow: 1.8

1-methyl-2-pyrrolidone:

Partition coefficient: n-octanol/water : log Pow: -0.46 (25 °C)

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Bioaccumulation : Species: Danio rerio (zebra fish)
Bioconcentration factor (BCF): 54
Remarks: See section 9 for octanol-water partition coefficient.

Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 5.5

cyclohexane:

Bioaccumulation : Species: Pimephales promelas (fathead minnow)
Bioconcentration factor (BCF): 167
Method: QSAR

Partition coefficient: n-octanol/water : log Pow: 3.44 (20 °C)
pH: 7

2,6-di-tert-butyl-p-cresol:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 1,277
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 5.1

12.4 Mobility in soil

Components:

abamectin (combination of avermectin B1a and avermectin B1b) (ISO):

Distribution among environmental compartments : Remarks: Mobile in soils

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Product:

Endocrine disrupting potential : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14: Transport information

14.1 UN number

IMDG : UN 3082

IATA : UN 3082

14.2 UN proper shipping name

IMDG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Abamectin)

IATA : Environmentally hazardous substance, liquid, n.o.s. (Abamectin)

14.3 Transport hazard class(es)

IMDG : 9

IATA : 9

14.4 Packing group

IMDG

Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F

IATA (Cargo)

Packing instruction (cargo aircraft)	:	964
Packing instruction (LQ)	:	Y964
Packing group	:	III
Labels	:	Miscellaneous

IATA (Passenger)

Packing instruction (passenger aircraft)	:	964
Packing instruction (LQ)	:	Y964
Packing group	:	III
Labels	:	Miscellaneous

14.5 Environmental hazards

IMDG

Marine pollutant : yes

14.6 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.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

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

TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	Product contains substance(s) not listed on TSCA inventory.
AIIC	:	Not in compliance with the inventory
DSL	:	This product contains the following components that are not on the Canadian DSL nor NDSL. abamectin (combination of avermectin B1a and avermectin B1b) (ISO)
ENCS	:	Not in compliance with the inventory
ISHL	:	Not in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	Not in compliance with the inventory
NZIoC	:	Not in compliance with the inventory
TECI	:	Not in compliance with the inventory

15.2 Chemical Safety Assessment

SECTION 16: Other information

Full text of H-Statements

H225	:	Highly flammable liquid and vapor.
H226	:	Flammable liquid and vapor.

H300	:	Fatal if swallowed.
H302	:	Harmful if swallowed.
H304	:	May be fatal if swallowed and enters airways.
H312	:	Harmful in contact with skin.
H315	:	Causes skin irritation.
H319	:	Causes serious eye irritation.
H330	:	Fatal if inhaled.
H335	:	May cause respiratory irritation.
H336	:	May cause drowsiness or dizziness.
H360D	:	May damage the unborn child.
H361d	:	Suspected of damaging the unborn child.
H372	:	Causes damage to organs through prolonged or repeated exposure.
H400	:	Very toxic to aquatic life.
H410	:	Very toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Aquatic Acute	:	Short-term (acute) aquatic hazard
Aquatic Chronic	:	Long-term (chronic) aquatic hazard
Asp. Tox.	:	Aspiration hazard
Eye Irrit.	:	Eye irritation
Flam. Liq.	:	Flammable liquids
Repr.	:	Reproductive toxicity
Skin Irrit.	:	Skin irritation
STOT RE	:	Specific target organ toxicity - repeated exposure
STOT SE	:	Specific target organ toxicity - single exposure
2006/15/EC	:	Europe. Indicative occupational exposure limit values
2009/161/EU	:	Europe. COMMISSION DIRECTIVE 2009/161/EU establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC
ZA OEL	:	South Africa. Hazardous Chemical Substances Regulations, Occupational Exposure Limits
ZA OEL	:	South Africa. The Regulations for Hazardous Chemical Agents, Occupational Exposure Limits
2006/15/EC / TWA	:	Limit Value - eight hours
2009/161/EU / TWA	:	Limit Value - eight hours
2009/161/EU / STEL	:	Short term exposure limit
ZA OEL / OEL-RL	:	Occupational Exposure Limit Restricted limit - 8- hour exposure or equivalent (12 hour shifts)
ZA OEL / OEL-RL	:	Occupational Exposure Limit Restricted limit - 8- hour exposure or equivalent (12 hour shifts)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; 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; 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 car-

rying 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; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; 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

Other information :

Classification of the mixture:		**Classification procedure:**
Acute Tox. 4	H302	Based on product data or assessment
Acute Tox. 4	H332	Based on product data or assessment
Repr. 1B	H360D	Based on product data or assessment
STOT SE 3	H335	Based on product data or assessment
STOT RE 2	H373	Based on product data or assessment
Aquatic Acute 1	H400	Based on product data or assessment
Aquatic Chronic 1	H410	Calculation method

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