

Milbemycin Oxime / Lufenuron Formulation

Version 6.0 Revision Date: 2023/09/30 SDS Number: 6365221-00008 Date of last issue: 2023/04/04
Date of first issue: 2020/09/21

1. PRODUCT AND COMPANY IDENTIFICATION

Chemical product name : Milbemycin Oxime / Lufenuron Formulation

Supplier's company name, address and phone number

Company name of supplier : MSD

Address : Kumagaya, Saitama Prefecture , Xicheng 810 MSD Co., Ltd.
Menuuma factory

Telephone : 048-588-8411

E-mail address : EHSDATASTEWARD@msd.com

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

Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product

Restrictions on use : Not applicable

2. HAZARDS IDENTIFICATION**GHS classification of chemical product**

Skin sensitisation : Category 1

Reproductive toxicity : Category 1B

Specific target organ toxicity - repeated exposure (Oral) : Category 1 (Central nervous system, Lungs, Liver, Stomach)

Specific target organ toxicity - repeated exposure : Category 2 (Central nervous system)

Short-term (acute) aquatic hazard : Category 1

Long-term (chronic) aquatic hazard : Category 1

GHS label elements

Hazard pictograms :



Signal word : Danger

Milbemycin Oxime / Lufenuron Formulation

Version 6.0 Revision Date: 2023/09/30 SDS Number: 6365221-00008 Date of last issue: 2023/04/04
 Date of first issue: 2020/09/21

Hazard statements : H317 May cause an allergic skin reaction.
 H360D May damage the unborn child.
 H372 Causes damage to organs (Central nervous system, Lungs, Liver, Stomach) through prolonged or repeated exposure if swallowed.
 H373 May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
 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.
 P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 P264 Wash skin thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P272 Contaminated work clothing should not be allowed out of the workplace.
 P273 Avoid release to the environment.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
 P302 + P352 IF ON SKIN: Wash with plenty of water.
 P308 + P313 IF exposed or concerned: Get medical advice/ attention.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P362 + P364 Take off contaminated clothing and wash it before reuse.
 P391 Collect spillage.

Storage:
 P405 Store locked up.

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

Other hazards which do not result in classification

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)	ENCS No.
Lufenuron (ISO)	103055-07-8	30.7	
Cellulose	9004-34-6	>= 10 - < 20	
Starch	9005-25-8	>= 1 - < 10	8-98

Milbemycin Oxime / Lufenuron Formulation

Version 6.0	Revision Date: 2023/09/30	SDS Number: 6365221-00008	Date of last issue: 2023/04/04 Date of first issue: 2020/09/21
----------------	------------------------------	------------------------------	---

Milbemycin Oxime	129496-10-2	>= 1 - < 2.5	
------------------	-------------	--------------	--

4. FIRST AID MEASURES

- General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.
- If inhaled : If inhaled, remove to fresh air.
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 : May cause an allergic skin reaction.
May damage the unborn child.
Causes damage to organs through prolonged or repeated exposure if swallowed.
May cause damage to organs through prolonged or repeated exposure.
- 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.

5. FIREFIGHTING 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)
Metal 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.

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

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

6. ACCIDENTAL RELEASE MEASURES

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.
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 : Sweep up or vacuum up spillage and collect in suitable container for disposal.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

7. HANDLING AND STORAGE

Handling

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

Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation.

Advice on safe handling : Do not get on skin or clothing.
Do not breathe dust, fume, gas, mist, vapours or spray.
Do not swallow.
Avoid contact with eyes.
Wash skin thoroughly after handling.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Keep container tightly closed.
Do not eat, drink or smoke when using this product.
Take care to prevent spills, waste and minimize release to the environment.

Avoidance of contact : Oxidizing agents

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.
When using do not eat, drink or smoke.
Contaminated work clothing should not be allowed out of the workplace.

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

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.

Storage

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

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

Packaging material : Unsuitable material: None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Reference concentration / Permissible concentration	Basis
Lufenuron (ISO)	103055-07-8	TWA	OEB 3 ($\geq 10 < 100 \mu\text{g}/\text{m}^3$)	Internal
Cellulose	9004-34-6	TWA	10 mg/m ³	ACGIH
Starch	9005-25-8	TWA	10 mg/m ³	ACGIH
Milbemycin Oxime	129496-10-2	TWA	0.1 mg/m ³ (OEB2)	Internal

Engineering measures : All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.
Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).
Minimize open handling.

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 : Particulates type

Hand protection

Material : Chemical-resistant gloves

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Remarks	:	Consider double gloving.
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. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces. Use appropriate degowning techniques to remove potentially contaminated clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	solid
Colour	:	brown
Odour	:	odourless
Odour Threshold	:	No data available
Melting point/freezing point	:	No data available
Boiling point, initial boiling point and boiling range	:	No data available
Flammability (solid, gas)	:	No data available
Flammability (liquids)	:	Not applicable
Lower explosion limit and upper explosion limit / flammability limit	:	
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Flash point	:	Not applicable
Decomposition temperature	:	No data available
pH	:	No data available
Evaporation rate	:	Not applicable
Auto-ignition temperature	:	No data available
Viscosity	:	
Viscosity, kinematic	:	Not applicable

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Solubility(ies)
Water solubility : soluble

Partition coefficient: n-octanol/water : Not applicable

Vapour pressure : Not applicable

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

Density : No data available

Relative vapour density : Not applicable

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

10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.

Chemical stability : Stable under normal conditions.

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

Conditions to avoid : None known.

Incompatible materials : Oxidizing agents

Hazardous decomposition products : No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Not classified based on available information.

Product:

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

Acute inhalation toxicity : Acute toxicity estimate: > 5 mg/l

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Exposure time: 4 h
 Test atmosphere: dust/mist
 Method: Calculation method

Components:

Lufenuron (ISO):

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg
		LD50 (Mouse): > 2,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 2,350 mg/m ³ Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg

Cellulose:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 5.8 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg

Starch:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg

Milbemycin Oxime:

Acute oral toxicity	:	LD50 (Rat): 532 - 863 mg/kg
		LD50 (Mouse): 722 - 946 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 1,200 mg/m ³ Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Components:

Lufenuron (ISO):

Species	:	Rabbit
Method	:	Draize Test

Milbemycin Oxime / Lufenuron Formulation

Version 6.0 Revision Date: 2023/09/30 SDS Number: 6365221-00008 Date of last issue: 2023/04/04
Date of first issue: 2020/09/21

||Result : No skin irritation

Milbemycin Oxime:

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

Serious eye damage/eye irritation

Not classified based on available information.

Components:**Lufenuron (ISO):**

||Species : Rabbit
||Result : No eye irritation
||Method : Draize Test

Starch:

||Species : Rabbit
||Result : No eye irritation

Milbemycin Oxime:

||Species : Rabbit
||Result : No eye irritation

Respiratory or skin sensitisation**Skin sensitisation**

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified based on available information.

Components:**Lufenuron (ISO):**

||Test Type : Maximisation Test
||Species : Guinea pig
||Assessment : May cause sensitisation by skin contact.
||Result : Sensitiser

Starch:

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

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Milbemycin Oxime:

Exposure routes	:	Skin contact
Species	:	Guinea pig
Result	:	negative

Germ cell mutagenicity

Not classified based on available information.

Components:

Lufenuron (ISO):

Genotoxicity in vitro	:	Test Type: Ames test Result: negative
		Test Type: Mouse Lymphoma Test system: Chinese hamster cells Result: negative
		Test Type: Cytogenetic assay Test system: Chinese hamster ovary cells Result: negative
		Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro) Test system: rat hepatocytes Result: negative
		Test system: Human lymphocytes Result: negative
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Result: negative
		Test Type: Unscheduled DNA synthesis test (UDS) in testicular cells Species: Rat Result: negative
Germ cell mutagenicity - Assessment	:	Weight of evidence does not support classification as a germ cell mutagen.

Cellulose:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative
		Test Type: In vitro mammalian cell gene mutation test Result: negative
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo)

Milbemycin Oxime / Lufenuron Formulation

Version 6.0 Revision Date: 2023/09/30 SDS Number: 6365221-00008 Date of last issue: 2023/04/04
Date of first issue: 2020/09/21

cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Result: negative

Starch:

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

Milbemycin Oxime:

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

Carcinogenicity

Not classified based on available information.

Components:**Lufenuron (ISO):**

Species : Rat
Application Route : Ingestion
Exposure time : 18 month(s)
Result : negative

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

Cellulose:

Species : Rat
Application Route : Ingestion
Exposure time : 72 weeks
Result : negative

Reproductive toxicity

May damage the unborn child.

Components:**Lufenuron (ISO):**

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat

Milbemycin Oxime / Lufenuron Formulation

Version 6.0 Revision Date: 2023/09/30 SDS Number: 6365221-00008 Date of last issue: 2023/04/04
 Date of first issue: 2020/09/21

	Application Route: Oral General Toxicity - Parent: NOAEL: 8.3 mg/kg wet weight Early Embryonic Development: NOAEL: 20.9 mg/kg body weight Result: Animal testing did not show any effects on fertility.
Effects on foetal development	: Test Type: Development Species: Rat Application Route: Oral General Toxicity Maternal: NOAEL: 500 mg/kg body weight Developmental Toxicity: NOAEL: 1,000 mg/kg body weight Symptoms: No adverse effects Remarks: No significant adverse effects were reported
	Test Type: Fertility/early embryonic development Species: Rat Application Route: Ingestion General Toxicity Maternal: NOAEL: 20.9 mg/kg body weight Embryo-foetal toxicity: 8.3 mg/kg body weight Result: foetal abnormalities
Reproductive toxicity - Assessment	: Clear evidence of adverse effects on development, based on animal experiments.

Cellulose:

Effects on fertility	: Test Type: One-generation reproduction toxicity study Species: Rat Application Route: Ingestion Result: negative
Effects on foetal development	: Test Type: Fertility/early embryonic development Species: Rat Application Route: Ingestion Result: negative

Milbemycin Oxime:

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

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Test Type: Embryo-foetal development
 Species: Dog
 Application Route: Ingestion
 Result: negative

STOT - single exposure

Not classified based on available information.

Components:

Lufenuron (ISO):

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

Causes damage to organs (Central nervous system, Lungs, Liver, Stomach) through prolonged or repeated exposure if swallowed.

May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

Components:

Lufenuron (ISO):

Exposure routes : Oral
 Target Organs : Central nervous system, Lungs, Liver, Stomach
 Assessment : Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Milbemycin Oxime:

Exposure routes : Ingestion
 Target Organs : Central nervous system
 Assessment : Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Repeated dose toxicity

Components:

Lufenuron (ISO):

Species : Rat
 NOAEL : 5.34 mg/kg
 Application Route : oral (feed)
 Exposure time : 4 Months
 Target Organs : Central nervous system, digestive system
 Symptoms : central nervous system effects

Species : Rat
 NOAEL : 1.93 mg/kg
 Application Route : oral (feed)
 Exposure time : 2 yr
 Symptoms : central nervous system effects, Convulsions

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Species	: Mouse
NOAEL	: 2.12 mg/kg
Application Route	: oral (feed)
Exposure time	: 18 Months
Target Organs	: Central nervous system, Liver, Prostate
Symptoms	: central nervous system effects, Convulsions

Species	: Dog
NOAEL	: 7.02 mg/kg
Application Route	: oral (feed)
Exposure time	: 1 yr
Target Organs	: Central nervous system, Liver, Lungs
Symptoms	: Convulsions, Fatality, Irregularities

Cellulose:

Species	: Rat
NOAEL	: >= 9,000 mg/kg
Application Route	: Ingestion
Exposure time	: 90 Days

Starch:

Species	: Rat
NOAEL	: >= 2,000 mg/kg
Application Route	: Skin contact
Exposure time	: 28 Days
Method	: OECD Test Guideline 410

Milbemycin Oxime:

Species	: Rat
NOAEL	: 3 mg/kg
LOAEL	: 15 mg/kg
Application Route	: Ingestion
Exposure time	: 90 Days
Symptoms	: Liver disorders, Blood disorders

Species	: Dog
LOAEL	: 8.6 mg/kg
Application Route	: Ingestion
Exposure time	: 3 Days
Symptoms	: Tremors

Aspiration toxicity

Not classified based on available information.

Experience with human exposure**Components:****Lufenuron (ISO):**

General Information	: Remarks: May be harmful if swallowed.
---------------------	---

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

|| May cause neurotoxic effects.

Milbemycin Oxime:

|| Ingestion : Symptoms: Salivation, Convulsions, Diarrhoea, Weakness, Vomiting, Tremors, Coma
Remarks: Based on Animal Evidence

12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:****Lufenuron (ISO):**

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 73,100 µg/l
		Exposure time: 96 h
		Method: OECD Test Guideline 203
	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 29,000 µg/l
		Exposure time: 96 h
		Method: OECD Test Guideline 203
	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 370 µg/l
		Exposure time: 96 h
		Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Americamysis): 0.042 µg/l
		Exposure time: 96 h
		Method: US-EPA OPPTS 850.1035
Toxicity to algae/aquatic plants	:	EC50 (Raphidocelis subcapitata (freshwater green alga)): 209 µg/l
		Exposure time: 72 h
		Method: OECD Test Guideline 201
	:	EC50 (Scenedesmus subspicatus): 17 µg/l
		Exposure time: 72 h
		Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	:	10,000
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 80 µg/l
		Exposure time: 33 d
		Method: OECD Test Guideline 210
	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 20 µg/l
		Exposure time: 359 d
		Method: OECD Test Guideline 229
Toxicity to daphnia and other	:	NOEC (Daphnia magna (Water flea)): 8.38 µg/l

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

aquatic invertebrates (Chronic toxicity)

Exposure time: 21 d
Method: OECD Test Guideline 211

NOEC (*Daphnia magna* (Water flea)): 90 µg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

NOEC (*Chironomus riparius* (harlequin fly)): 2 µg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : 10

Cellulose:

Toxicity to fish : LC50 (*Oryzias latipes* (Japanese medaka)): > 100 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Milbemycin Oxime:

Toxicity to fish : LC50 (*Oncorhynchus mykiss* (rainbow trout)): 0.16 µg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (*Daphnia magna* (Water flea)): 0.03 µg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : EC50: > 87 µg/l
Exposure time: 72 h

M-Factor (Acute aquatic toxicity) : 10,000

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (*Daphnia magna* (Water flea)): 0.01 µg/l

M-Factor (Chronic aquatic toxicity) : 10,000

Persistence and degradability**Components:****Cellulose:**

Biodegradability : Result: Readily biodegradable.

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

Bioaccumulation : Species: *Lepomis macrochirus* (Bluegill sunfish)
Bioconcentration factor (BCF): 28
Method: OECD Test Guideline 305

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Partition coefficient: n-octanol/water : log Pow: 5.12

Milbemycin Oxime:

Bioaccumulation : Bioconcentration factor (BCF): 440

Partition coefficient: n-octanol/water : log Pow: 7

Mobility in soil**Components:****Lufenuron (ISO):**

Distribution among environmental compartments : log Koc: 5.38
Method: OECD Test Guideline 106

Hazardous to the ozone layer

Not applicable

Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS**Disposal methods**

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

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

14. TRANSPORT INFORMATION**International Regulations****UNRTDG**

UN number : UN 3077

Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(Milbemycin Oxime, Lufenuron (ISO))

Class : 9

Packing group : III

Labels : 9

Environmentally hazardous : yes

IATA-DGR

UN/ID No. : UN 3077

Proper shipping name : Environmentally hazardous substance, solid, n.o.s.
(Milbemycin Oxime, Lufenuron (ISO))

Class : 9

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Packing group : III
Labels : Miscellaneous
Packing instruction (cargo aircraft) : 956
Packing instruction (passenger aircraft) : 956
Environmentally hazardous : yes

IMDG-Code

UN number : UN 3077
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(Milbemycin Oxime, Lufenuron (ISO))
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

Refer to section 15 for specific national regulation.

Special precautions for user

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

ERG Code : 171

15. REGULATORY INFORMATION**Related Regulations****Fire Service Law**

Not applicable to dangerous materials / designated flammables.

Chemical Substance Control Law

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

Industrial Safety and Health Law**Harmful Substances Prohibited from Manufacture**

Not applicable

Harmful Substances Required Permission for Manufacture

Not applicable

Substances Prevented From Impairment of Health

Not applicable

Milbemycin Oxime / Lufenuron Formulation

Version 6.0 Revision Date: 2023/09/30 SDS Number: 6365221-00008 Date of last issue: 2023/04/04
 Date of first issue: 2020/09/21

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

Not applicable

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

Not applicable

Substances Subject to be Notified Names

Article 57-2 (Enforcement Order Table 9)

Chemical name	Concentration (%)	Remarks
CGA 184699	>=30 - <40	From April 1st, 2026

Substances Subject to be Indicated Names

Article 57 (Enforcement Order Article 18)

Chemical name	Remarks
CGA 184699	From April 1st, 2026

Ordinance on Prevention of Hazards Due to Specified Chemical Substances

Not applicable

Ordinance on Prevention of Lead Poisoning

Not applicable

Ordinance on Prevention of Tetraalkyl Lead Poisoning

Not applicable

Ordinance on Prevention of Organic Solvent Poisoning

Not applicable

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

Not applicable

Poisonous and Deleterious Substances Control Law

Not applicable

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

Chemical name	Administration number	Concentration (%)
(RS)-1-[2,5-Dichloro-4-(1,1,2,3,3,3-hexafluoropropoxy)phenyl]-3-(2,6-difluorobenzoyl)urea	499	31

High Pressure Gas Safety Act

Not applicable

Explosive Control Law

Not applicable

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

Vessel Safety Law

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

Aviation Law

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

Marine Pollution and Sea Disaster Prevention etc Law

Bulk transportation : Not classified as noxious liquid substance

Pack transportation : Classified as marine pollutant

Narcotics and Psychotropics Control Act

Narcotic or Psychotropic Raw Material (Export / Import Permission)

Not applicable

Specific Narcotic or Psychotropic Raw Material (Export / Import permission)

Not applicable

Waste Disposal and Public Cleansing Law

Industrial waste

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

AICS : not determined

DSL : not determined

IECSC : not determined

16. OTHER INFORMATION**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 : yyyy/mm/dd

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)

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

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with

Milbemycin Oxime / Lufenuron Formulation

Version	Revision Date:	SDS Number:	Date of last issue: 2023/04/04
6.0	2023/09/30	6365221-00008	Date of first issue: 2020/09/21

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

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

JP / EN