ACURON FLEXI

Version	Revision Date:	SDS Number:	This version replaces all previous versions.
2.1	02/21/2023	S00042708491	

SECTION 1. IDENTIFICATION

Product name : ACURON FLEXI
Design code. : A20540D

Product Registration number : 100-1568

Manufacturer or supplier's details

Company name of supplier : Syngenta Crop Protection, LLC
Address : Post Office Box 18300
Greensboro NC 27419
United States of America (USA)

Telephone : 1 800 334 9481
Telefax : 1 336 632 2192

E-mail address : sds.requests@syngenta.com
Emergency telephone : 1 800 888 8372

Recommended use of the chemical and restrictions on use

Recommended use : Herbicide

Restrictions on use : General Use Pesticide

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin sensitization : Category 1

Reproductive toxicity : Category 1B

GHS label elements

Hazard pictograms :

Signal Word : Danger

Hazard Statements : H317 May cause an allergic skin reaction.
H360D May damage the unborn child.

Precautionary Statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing mist or vapors.
P272 Contaminated work clothing must not be allowed out of the workplace.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.

Storage:

P405 Store locked up.

Disposal:

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

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
S-metolachlor	87392-12-9	31.242
propane-1,2-diol	57-55-6	>= 1 - < 5
mesotrione	104206-82-8	3.4712
benoxacor	98730-04-2	>= 1 - < 5
nitric acid ammonium salt	6484-52-2	>= 1 - < 5
amines, coco alkyl, ethoxylated	61791-14-8	>= 1 - < 5
calcium dodecylbenzene sulphonate	26264-06-2	>= 1 - < 5
poly(oxy-1,2-ethanediyl), alpha-tridecyl-omega-hydroxy-, phosphate	9046-01-9	>= 1 - < 5
bicyclopyrone	352010-68-5	0.8676
copper(II) hydroxide	20427-59-2	>= 0.1 - < 1
dioxosilane	14808-60-7	>= 0.1 - < 1
5-chloro-2-methyl-1,2-thiazol-3-one; 2-methyl-1,2-thiazol-3-one	55965-84-9	>= 0.0015 - < 0.1

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : Have the product container, label or Safety Data Sheet with you when calling the emergency number, a poison control center or physician, or going for treatment.

If inhaled : Take the victim into fresh air.
If breathing is irregular or stopped, administer artificial respiration.
Keep patient warm and at rest.
Call a physician or poison control center immediately.

In case of skin contact	:	Take off all contaminated clothing immediately. Wash off immediately with plenty of water. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.
In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.
If swallowed	:	If swallowed, seek medical advice immediately and show this container or label. Do NOT induce vomiting.
Most important symptoms and effects, both acute and delayed	:	Nonspecific No symptoms known or expected.
Notes to physician	:	There is no specific antidote available. Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Extinguishing media - small fires Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Extinguishing media - large fires Alcohol-resistant foam or Water spray
Unsuitable extinguishing media	:	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards during fire fighting	:	As the product contains combustible organic ingredients, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Exposure to decomposition products may be a hazard to health.
Further information	:	Do not allow run-off from fire fighting to enter drains or water courses. Cool closed containers exposed to fire with water spray.
Special protective equipment for fire-fighters	:	Wear full protective clothing and self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and 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). Clean contaminated surface thoroughly.

Clean with detergents. Avoid solvents.
Retain and dispose of contaminated wash water.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : No special protective measures against fire required.
Avoid contact with skin and eyes.
When using do not eat, drink or smoke.
For personal protection see section 8.

Conditions for safe storage : No special storage conditions required.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Keep out of the reach of children.
Keep away from food, drink and animal feedingstuffs.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
S-metolachlor	87392-12-9	TWA	5 mg/m3	Syngenta
propane-1,2-diol	57-55-6	TWA	10 mg/m3	US WEEL
mesotrione	104206-82-8	TWA	5 mg/m3	Syngenta
benoxacor	98730-04-2	TWA	1 mg/m3	Syngenta
bicyclopyrone	352010-68-5	TWA	0.7 mg/m3	Syngenta
copper(II) hydroxide	20427-59-2	TWA	1 mg/m3 (Copper)	NIOSH REL
dioxosilane	14808-60-7	TWA (respirable)	10 mg/m3 / %SiO2+2	OSHA Z-3
		TWA (respirable)	250 mppcf / %SiO2+5	OSHA Z-3
		TWA (respirable dust fraction)	0.1 mg/m3	OSHA P0
		TWA (Respirable particulate matter)	0.025 mg/m3 (Silica)	ACGIH
		TWA (Respirable dust)	0.05 mg/m3 (Silica)	NIOSH REL
		TWA (Respirable dust)	0.05 mg/m3	OSHA Z-1

Engineering measures : THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION AND PACKAGING OF THE PRODUCT. FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.

Containment and/or segregation is the most reliable technical protection measure if exposure cannot be eliminated.

The extent of these protection measures depends on the actual risks in use.
Maintain air concentrations below occupational exposure standards.
Where necessary, seek additional occupational hygiene advice.

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection

Remarks : Wear protective gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. The break through time depends amongst other things from the material, the thickness and the type of glove and therefore has to be measured for each case. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : No special protective equipment required.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Remove and wash contaminated clothing before re-use.
Wear as appropriate:
Impervious clothing

Protective measures : The use of technical measures should always have priority over the use of personal protective equipment.
When selecting personal protective equipment, seek appropriate professional advice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	suspension
Color	:	olive green
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	3 - 7 Concentration: 100 %w/v
Melting point/range	:	No data available
Boiling point/boiling range	:	No data available

Flash point	:	Method: Pensky-Martens closed cup does not flash
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Density	:	1.08 - 1.12 g/cm3 (68 °F / 20 °C)
Solubility(ies)		
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	797 °F / 425 °C
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.
Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	None reasonably foreseeable.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	No decomposition if used as directed.
Incompatible materials	:	None known.
Hazardous decomposition products	:	No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Ingestion
Inhalation
Skin contact
Eye contact

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat, female): > 5,000 mg/kg Remarks: Based on data from similar materials
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 2.56 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity Remarks: Based on data from similar materials
Acute dermal toxicity	:	LD50 (Rat, male and female): > 5,000 mg/kg Remarks: Based on data from similar materials

Components:

S-metolachlor:

Acute oral toxicity	:	LD50 (Rat, male and female): 2,672 mg/kg
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 2.91 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rabbit, male and female): > 2,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

mesotrione:

Acute oral toxicity	:	LD50 (Rat, male and female): > 5,000 mg/kg
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 4.75 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rat, male and female): > 2,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

benoxacor:

Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): > 2 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit, male and female): > 2,010 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

nitric acid ammonium salt:

Acute oral toxicity : LD50 (Rat): 2,462 mg/kg

amines, coco alkyl, ethoxylated:

Acute oral toxicity : Assessment: The component/mixture is moderately toxic after single ingestion.

bicyclopyrone:

Acute oral toxicity : LD50 (Rat, female): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): > 5.21 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rat, male and female): > 5,000 mg/kg

copper(II) hydroxide:

Acute oral toxicity : LD50 (Rat): 489 mg/kg

Acute inhalation toxicity : LC50 (Rat): 0.47 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

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

5-chloro-2-methyl-1,2-thiazol-3-one; 2-methyl-1,2-thiazol-3-one:

Acute oral toxicity : Assessment: The component/mixture is toxic after single ingestion.

Acute inhalation toxicity : Assessment: The component/mixture is highly toxic after short term inhalation.

Acute dermal toxicity : Assessment: The component/mixture is highly toxic after single contact with skin.

Skin corrosion/irritation

Product:

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

Components:

S-metolachlor:

Species	:	Rabbit
Result	:	No skin irritation

mesotrione:

Species	:	Rabbit
Result	:	No skin irritation

benoxacor:

Species	:	Rabbit
Result	:	No skin irritation

amines, coco alkyl, ethoxylated:

Result	:	Corrosive after 3 minutes to 1 hour of exposure

calcium dodecylbenzene sulphonate:

Result	:	Irritating to skin.

poly(oxy-1,2-ethanediyl), alpha-tridecyl-omega-hydroxy-, phosphate:

Result	:	Irritating to skin.

bicyclopyrone:

Species	:	Rabbit
Result	:	No skin irritation

copper(II) hydroxide:

Species	:	Rabbit
Result	:	No skin irritation

5-chloro-2-methyl-1,2-thiazol-3-one; 2-methyl-1,2-thiazol-3-one:

Result	:	Corrosive after 1 to 4 hours of exposure

Serious eye damage/eye irritation

Product:

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

Components:

S-metolachlor:

Species : Rabbit
Result : No eye irritation

mesotrione:

Species : Rabbit
Result : No eye irritation

benoxacor:

Species : Rabbit
Result : No eye irritation

nitric acid ammonium salt:

Result : Eye irritation

amines, coco alkyl, ethoxylated:

Result : Irreversible effects on the eye

calcium dodecylbenzene sulphonate:

Result : Risk of serious damage to eyes.

poly(oxy-1,2-ethanediyl), alpha-tridecyl-omega-hydroxy-, phosphate:

Result : Risk of serious damage to eyes.

bicyclopyrone:

Species : Rabbit
Result : No eye irritation

copper(II) hydroxide:

Species : Rabbit
Result : Irreversible effects on the eye

Respiratory or skin sensitization

Product:

Test Type : Local lymph node assay (LLNA)
Species : Mouse
Result : May cause sensitization by skin contact.
Remarks : Based on data from similar materials

Components:

S-metolachlor:

Species : Guinea pig
Result : The product is a skin sensitizer, sub-category 1B.

mesotrione:

Species : Guinea pig
Result : Does not cause skin sensitization.

benoxacor:

Species : Guinea pig
Result : May cause sensitization by skin contact.

bicyclopyrone:

Test Type : mouse lymphoma cells
Species : Mouse
Result : Did not cause sensitization on laboratory animals.

copper(II) hydroxide:

Species : Guinea pig
Result : Did not cause sensitization on laboratory animals.

5-chloro-2-methyl-1,2-thiazol-3-one; 2-methyl-1,2-thiazol-3-one:

Result : The product is a skin sensitizer, sub-category 1A.

Germ cell mutagenicity

Components:

S-metolachlor:

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

mesotrione:

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

benoxacor:

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

bicyclopyrone:

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

copper(II) hydroxide:

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects., Information given is based on data obtained from similar substances.

Carcinogenicity

Components:

S-metolachlor:

Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.

mesotrione:

Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.

benoxacor:

Carcinogenicity - Assessment : No evidence of carcinogenicity in animal studies.

bicyclopyrone:

Carcinogenicity - Assessment : This substance has been reported to cause tumors in certain animal species., These is no evidence that these findings are relevant to humans., Weight of evidence does not support classification as a carcinogen

copper(II) hydroxide:

Carcinogenicity - Assessment : No evidence of carcinogenicity in animal studies., Information given is based on data obtained from similar substances.

dioxosilane:

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

IARC has concluded that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz or cristobalite from occupational sources and in experimental animals from quartz and cristobalite (Group 1). It was noted however, that carcinogenicity was not detected in all industrial circumstances and may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity.

IARC	Group 1: Carcinogenic to humans	
	dioxosilane (Silica dust, crystalline)	14808-60-7
	Group 2A: Probably carcinogenic to humans	
	nitric acid ammonium salt (nitrate (ingested) under conditions that result in endogenous nitrosation)	6484-52-2
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.	
NTP	Known to be human carcinogen	
	dioxosilane (Silica, Crystalline (Respirable Size))	14808-60-7

Reproductive toxicity

Components:

S-metolachlor:

Reproductive toxicity - Assessment : Animal testing did not show any effects on fertility.

mesotrione:

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

benoxacor:

Reproductive toxicity - Assessment	:	No toxicity to reproduction

bicyclopyrone:

Reproductive toxicity - Assessment	:	Animal testing did not show any effects on fertility., These concentrations exceed relevant human dose levels., Clear evidence of adverse effects on development, based on animal experiments.

copper(II) hydroxide:

Reproductive toxicity - Assessment	:	No toxicity to reproduction, Information given is based on data obtained from similar substances.

STOT-repeated exposure

Components:

S-metolachlor:

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

mesotrione:

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

benoxacor:

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

bicyclopyrone:

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

copper(II) hydroxide:

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

dioxosilane:

Routes of exposure	:	Inhalation
Target Organs	:	Lungs
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

S-metolachlor:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 1.23 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Americamysis): 1.4 mg/l Exposure time: 96 h
Toxicity to algae/aquatic plants	:	ErC50 (Raphidocelis subcapitata (freshwater green alga)): 0.077 mg/l Exposure time: 96 h NOEC (Raphidocelis subcapitata (freshwater green alga)): 0.016 mg/l End point: Growth rate Exposure time: 96 h EC50 (Lemna gibba (gibbous duckweed)): 0.023 mg/l Exposure time: 14 d NOEC (Lemna gibba (gibbous duckweed)): 0.0076 mg/l Exposure time: 14 d
M-Factor (Acute aquatic toxicity)	:	10
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 0.03 mg/l Exposure time: 35 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Americamysis): 0.13 mg/l Exposure time: 28 d
M-Factor (Chronic aquatic toxicity)	:	10

mesotrione:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 120 mg/l Exposure time: 96 h LC50 (Cyprinus carpio (Carp)): > 97.1 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 900 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Raphidocelis subcapitata (freshwater green alga)): 12 mg/l Exposure time: 96 h NOEC (Raphidocelis subcapitata (freshwater green alga)): 0.75 mg/l

End point: Growth rate
Exposure time: 96 h

ErC50 (Lemna gibba (gibbous duckweed)): 0.0301 mg/l
Exposure time: 7 d

EC10 (Lemna gibba (gibbous duckweed)): 0.00187 mg/l
End point: Growth rate
Exposure time: 7 d

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 12.5 mg/l
Exposure time: 36 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 180 mg/l
Exposure time: 21 d

M-Factor (Chronic aquatic toxicity) : 10

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

benoxacor:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 2.9 mg/l
Exposure time: 96 h

LC50 (Ictalurus punctatus (channel catfish)): 1.4 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 17 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 13.5 mg/l
Exposure time: 72 h

EC10 (Desmodesmus subspicatus (green algae)): 0.22 mg/l
Exposure time: 72 h

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 0.31 mg/l
Exposure time: 32 d

NOEC (Oncorhynchus mykiss (rainbow trout)): 0.016 mg/l
Exposure time: 21 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.354 mg/l
Exposure time: 21 d

amines, coco alkyl, ethoxylated:

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

calcium dodecylbenzene sulphonate:

Ecotoxicology Assessment

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

poly(oxy-1,2-ethanediyl), alpha-tridecyl-omega-hydroxy-, phosphate:

Ecotoxicology Assessment

Acute aquatic toxicity : Toxic to aquatic life.

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

bicyclopyrone:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l
Exposure time: 96 h

LC50 (Pimephales promelas (fathead minnow)): > 100 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (Raphidocelis subcapitata (freshwater green alga)): 5.4 mg/l
Exposure time: 96 h

EC10 (Raphidocelis subcapitata (freshwater green alga)): 1.9 mg/l
End point: Growth rate
Exposure time: 96 h

NOEC (Raphidocelis subcapitata (freshwater green alga)): 1 mg/l
End point: Growth rate
Exposure time: 96 h

ErC50 (Lemna gibba (gibbous duckweed)): 0.055 mg/l
Exposure time: 7 d

NOEC (Lemna gibba (gibbous duckweed)): 0.0032 mg/l
End point: Growth rate
Exposure time: 7 d

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 10 mg/l
Exposure time: 33 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 100 mg/l
Exposure time: 21 d

M-Factor (Chronic aquatic toxicity) : 10

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

Ecotoxicology Assessment

Acute aquatic toxicity	:	Very toxic to aquatic life.

copper(II) hydroxide:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 0.012 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.041 mg/l
Toxicity to algae/aquatic plants	:	ErC50 (Raphidocelis subcapitata (freshwater green alga)): 0.034 mg/l Exposure time: 72 h
M-Factor (Acute aquatic toxicity)	:	10
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 0.023 mg/l Exposure time: 92 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.046 mg/l Exposure time: 21 d
M-Factor (Chronic aquatic toxicity)	:	10

5-chloro-2-methyl-1,2-thiazol-3-one; 2-methyl-1,2-thiazol-3-one:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 0.22 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia): 0.1 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Raphidocelis subcapitata (freshwater green alga)): 0.048 mg/l Exposure time: 72 h NOEC (Raphidocelis subcapitata (freshwater green alga)): 0.0012 mg/l End point: Growth rate Exposure time: 72 h ErC50 (Skeletonema costatum (marine diatom)): 0.0052 mg/l Exposure time: 48 h NOEC (Skeletonema costatum (marine diatom)): 0.00064 mg/l End point: Growth rate Exposure time: 48 h
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 0.098 mg/l Exposure time: 28 d
Toxicity to daphnia and other	:	NOEC (Daphnia): 0.004 mg/l

aquatic invertebrates (Chronic toxicity)		Exposure time: 21 d

Persistence and degradability

Components:

S-metolachlor:

Biodegradability	:	Result: Not readily biodegradable.
Stability in water	:	Degradation half life: 53 - 147 d Remarks: Product is not persistent.

mesotrione:

Stability in water	:	Degradation half life: > 30 d (25 °C) Remarks: Persistent in water.

benoxacor:

Biodegradability	:	Result: Not readily biodegradable.

bicyclopyrone:

Biodegradability	:	Result: Not readily biodegradable.

5-chloro-2-methyl-1,2-thiazol-3-one; 2-methyl-1,2-thiazol-3-one:

Biodegradability	:	Result: Readily biodegradable.

Bioaccumulative potential

Components:

S-metolachlor:

Bioaccumulation	:	Remarks: Does not bioaccumulate.
Partition coefficient: n-octanol/water	:	log Pow: 3.05 (77 °F / 25 °C)

mesotrione:

Bioaccumulation	:	Remarks: Low bioaccumulation potential.

benoxacor:

Bioaccumulation	:	Remarks: Does not bioaccumulate.
Partition coefficient: n-octanol/water	:	log Pow: 2.6 (77 °F / 25 °C)

bicyclopyrone:

Bioaccumulation	:	Remarks: No data available
Partition coefficient: n-octanol/water	:	log Pow: -1.9 (77 °F / 25 °C)

Mobility in soil

Components:

S-metolachlor:

Distribution among environmental compartments	:	Remarks: Moderately mobile in soils
Stability in soil	:	Dissipation time: 12 - 46 d Percentage dissipation: 50 % (DT50) Remarks: Product is not persistent.

mesotrione:

Distribution among environmental compartments	:	Remarks: Highly mobile in soils
Stability in soil	:	Dissipation time: 6 - 105 d Percentage dissipation: 50 % (DT50) Remarks: Product is not persistent.

benoxacor:

Distribution among environmental compartments	:	Remarks: Moderately mobile in soils
Stability in soil	:	Dissipation time: 0.9 - 5.3 d Percentage dissipation: 50 % (DT50) Remarks: Product is not persistent.

bicyclopyrone:

Distribution among environmental compartments	:	Remarks: Very highly mobile in soil.
Stability in soil	:	Remarks: Product is not persistent.

Other adverse effects

Components:

mesotrione:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

benoxacor:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

bicyclopyrone:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Do not contaminate ponds, waterways or ditches with chemical or used container.

		Do not dispose of waste into sewer. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations.
Contaminated packaging	:	Empty remaining contents. Triple rinse containers. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (S-METOLACHLOR, MESOTRIONE)
Class	:	9
Packing group	:	III
Labels	:	9

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (S-METOLACHLOR, MESOTRIONE)
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. (S-METOLACHLOR, MESOTRIONE)
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.

Domestic regulation

49 CFR

Not regulated as a dangerous good

Remarks	:	Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to

facilitate multi-modal transport involving ICAO (IATA) or IMO.

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

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:
Caution
Causes moderate eye irritation.
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.
Avoid contact with skin, eyes or clothing.
Wear protective eyewear.
Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

SARA 304 Extremely Hazardous Substances Reportable Quantity

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Respiratory or skin sensitization
Reproductive toxicity

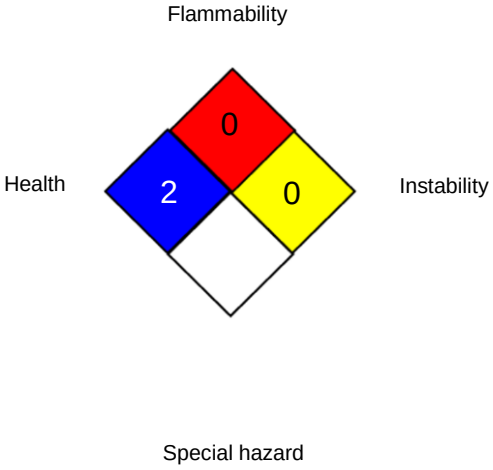
SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

nitric acid ammonium salt	6484-52-2	>= 1 - < 5 %

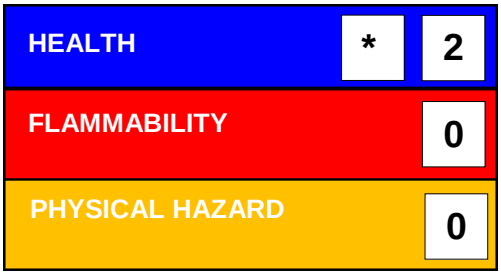
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
US WEEL	:	USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA P0 / TWA	:	8-hour time weighted average
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-3 / TWA	:	8-hour time weighted average
US WEEL / TWA	:	8-hr TWA

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; 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 Pre-

vention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; 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

Revision Date : 02/21/2023

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 given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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