SAFETY DATA SHEET

PIRATE HERBICIDE

Version	Revision Date:	Date of last issue:
1.0	07/15/2024	07/15/2024

SECTION 1. IDENTIFICATION

Product identifier
Product name PIRATE HERBICIDE

Other means of identification
Product code

Chemical nature Mixture

Recommended use of the chemical and restrictions on use
Recommended use Can be used as herbicide only.

Restrictions on use Use as recommended by the label.

Details of the supplier of the safety data sheet
Manufacturer Tenkoz, Inc.
1725 Windward Concourse, Suite 410
Alpharetta, GA 30005
USA

Emergency telephone For leak, fire, spill or accident emergencies, call:
1 800 / 424-9300 (CHEMTREC - U.S.A.)

Medical emergency:
U.S.A. & Canada: +1 800 / 424-9300

SECTION 2. HAZARDS IDENTIFICATION

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

Acute toxicity (Oral) : Category 4

Acute toxicity (Inhalation) : Category 4

Reproductive toxicity : Category 2

Specific target organ toxicity - repeated exposure : Category 2

GHS label elements

Hazard pictograms :

Signal Word : WARNING

Hazard Statements : H302 + H332 Harmful if swallowed or if inhaled.
H361d Suspected of damaging the unborn child.
H373 May cause damage to organs through prolonged or repeated exposure.

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 mist or vapors.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage:

P405 Store locked up.

Disposal:

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

Other hazards

Very toxic to aquatic life.
Very toxic to aquatic life with long lasting effects.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
atrazine (ISO)	1912-24-9	42.5
Pyroxasulfone	447399-55-5	5.15
Fluthiacet-methyl	117337-19-6	0.15
propane-1,2-diol	57-55-6	>= 5 - < 10
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5	>= 5 - < 10
aluminium oxide	1344-28-1	>= 1 - < 5

SECTION 4. 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 inhaled, remove to fresh air.
If unconscious, place in recovery position and seek medical advice.
If not breathing, give artificial respiration.
Call a physician or poison control center immediately.

In case of skin contact : Take off all contaminated clothing immediately.
Wash contaminated clothing before re-use.
Wash off immediately with plenty of water for at least 15 minutes.
Get medical attention immediately if irritation develops and persists.

In case of eye contact : Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : If swallowed, call a poison control center or doctor immediately.
DO NOT induce vomiting unless directed to do so by a physician or poison control center.
Give small amounts of water to drink.
Never give anything by mouth to an unconscious person.
Keep respiratory tract clear.

Most important symptoms and effects, both acute and delayed : Harmful if swallowed or if inhaled.
Suspected of damaging the unborn child.
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 protective clothing

Avoid inhalation, ingestion and contact with skin and eyes.
If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Notes to physician : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Dry chemical, CO2, water spray or regular foam.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

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

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

Hazardous combustion products : Carbon oxides
Nitrogen oxides (NOx)
Sulfur oxides
Halogenated compounds
Thermal decomposition can lead to release of irritating gases and vapors.

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.

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

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : 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.
Mark the contaminated area with signs and prevent access to unauthorized personnel.
Only qualified personnel equipped with suitable protective equipment may intervene.
For disposal considerations see section 13.

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.

Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	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. Dispose of rinse water in accordance with local and national regulations.
Conditions for safe storage	:	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.
Materials to avoid	:	Do not store near acids.
Further information on storage stability	:	No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
atrazine (ISO)	1912-24-9	TWA	5 mg/m3	NIOSH REL
		TWA	5 mg/m3	OSHA P0
		TWA (Inhalable particulate matter)	2 mg/m3	ACGIH
propane-1,2-diol	57-55-6	TWA	10 mg/m3	US WEEL
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5	TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH
aluminium oxide	1344-28-1	TWA (total dust)	15 mg/m3	OSHA Z-1
		TWA (respirable fraction)	5 mg/m3	OSHA Z-1
		TWA (Total	10 mg/m3	OSHA P0

		dust)		
		TWA (respirable dust fraction)	5 mg/m3	OSHA P0
		TWA (Respirable particulate matter)	1 mg/m3 (Aluminum)	ACGIH

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection
Material : Wear chemical resistant gloves, such as barrier laminate, butyl rubber or nitrile rubber.

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

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

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

Protective measures : Wear suitable protective equipment.
Always have on hand a first-aid kit, together with proper instructions.
When using do not eat, drink or smoke.

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

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state : liquid

Form : liquid, suspension

Color : white

Odor : solvent, aromatic

Odor Threshold : No data available

pH : 4.7

(1% solution in water)

Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	No data available
Flash point	:	> 212 °F / > 100 °C
Evaporation rate	:	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	:	9.43 lb/gal
Solubility(ies)		
Water solubility	:	No data available
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	No decomposition if stored and applied as directed.

Possibility of hazardous reactions	:	No decomposition if stored and applied as directed.
Conditions to avoid	:	Heat, flames and sparks.
Incompatible materials	:	Avoid strong acids, bases, and oxidizers.
Hazardous decomposition products	:	Carbon monoxide Carbon dioxide (CO2) Nitrogen oxides (NOx) Sulfur oxides Hydrogen fluoride

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Harmful if swallowed or if inhaled.

Product:

Acute oral toxicity	:	LD50 (Rat): 310.2 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 2.10 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg

Components:

atrazine (ISO):

Acute oral toxicity	:	LD50 (Rat, male and female): 1,960 mg/kg Method: OECD Test Guideline 401 Target Organs: Gastrointestinal tract Symptoms: Fatality, ataxia

Pyroxasulfone:

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg Remarks: no mortality
Acute inhalation toxicity	:	LC50 (Rat): > 6.56 mg/l Exposure time: 4 h Test atmosphere: dust/mist Remarks: no mortality
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg Remarks: no mortality

Fluthiacet-methyl:

Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
Method: FIFRA 81.01
Assessment: The substance or mixture has no acute oral toxicity
Remarks: no mortality

LD50 (Mouse, male and female): > 5,000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: no mortality

Acute inhalation toxicity : LC50 (Rat, male and female): > 2.02 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Symptoms: hypoactivity, Breathing difficulties
Assessment: The substance or mixture has no acute inhalation toxicity

LC50 (Rat): > 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: no mortality

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Assessment: The component/mixture is minimally toxic after single contact with skin.
Remarks: no mortality

LD50 (Rabbit, male and female): > 2,000 mg/kg
Method: EPA OPP 81-2
GLP: yes
Remarks: no mortality

propane-1,2-diol:

Acute oral toxicity : LD50 (Rat, male and female): 22,000 mg/kg

Acute inhalation toxicity : LC0 (Rabbit): 31.7 mg/l
Exposure time: 2 h
Test atmosphere: vapor
Remarks: no mortality

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

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

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

Acute inhalation toxicity	:	LC50 (Rat): > 4.688 mg/l Exposure time: 4 h Test atmosphere: vapor Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

aluminium oxide:

Acute oral toxicity	:	LD50 (Rat, male and female): > 15,900 mg/kg
Acute inhalation toxicity	:	LC50 (Rat, male): > 2.3 mg/l Exposure time: 4 h Test atmosphere: dust/mist Remarks: no mortality

Skin corrosion/irritation

Based on available data, the classification criteria are not met.

Product:

Species	:	Rabbit
Result	:	slight irritation

Components:

atrazine (ISO):

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	slight irritation

Pyroxasulfone:

Species	:	Rabbit
Result	:	No skin irritation

Fluthiacet-methyl:

Species	:	Rabbit
Assessment	:	No skin irritation
Result	:	No skin irritation

propane-1,2-diol:

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

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Species	:	Rabbit
Assessment	:	Repeated exposure may cause skin dryness or cracking.
Result	:	No skin irritation
Remarks	:	Minimal effects that do not meet the threshold for classification. Based on data from similar materials

aluminium oxide:

Species	:	Rabbit
Exposure time	:	24 h
Assessment	:	No skin irritation
Result	:	No skin irritation

Serious eye damage/eye irritation

Based on available data, the classification criteria are not met.

Product:

Species	:	Rabbit
Result	:	slight irritation

Components:

atrazine (ISO):

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

Pyroxasulfone:

Species	:	Rabbit
Result	:	slight irritation

Fluthiacet-methyl:

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	No eye irritation

propane-1,2-diol:

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

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Species	:	Rabbit
Assessment	:	No eye irritation
Remarks	:	Minimal effects that do not meet the threshold for classification. Based on data from similar materials

aluminium oxide:

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	No eye irritation

Respiratory or skin sensitization

Skin sensitization

Based on available data, the classification criteria are not met.

Respiratory sensitization

Based on available data, the classification criteria are not met.

Product:

Result	:	Does not cause skin sensitization.

Components:

atrazine (ISO):

Test Type	:	Maximization Test
Species	:	Guinea pig
Method	:	Regulation (EC) No. 440/2008, Annex, B.6
Result	:	May cause sensitization by skin contact.

Pyroxasulfone:

Test Type	:	Local lymph node assay (LLNA)
Species	:	Mouse
Result	:	Does not cause skin sensitization.

Fluthiacet-methyl:

Routes of exposure	:	Skin contact
Species	:	Guinea pig
Method	:	FIFRA 81.06
Result	:	Does not cause skin sensitization.

Test Type	:	Buehler Test
Routes of exposure	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Did not cause sensitization on laboratory animals.
GLP	:	yes

propane-1,2-diol:

Test Type	:	Maximization Test
Species	:	Guinea pig
Result	:	negative

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Test Type	:	Maximization Test
Species	:	Guinea pig

Result	:	Not a skin sensitizer.
Remarks	:	Based on data from similar materials

Germ cell mutagenicity

Based on available data, the classification criteria are not met.

Components:

atrazine (ISO):

Genotoxicity in vitro	:	Test Type: reverse mutation assay Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay) Result: negative
Germ cell mutagenicity - Assessment	:	In vitro tests did not show mutagenic effects

Pyroxasulfone:

Genotoxicity in vitro	:	Test Type: Ames test 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 Result: negative
Germ cell mutagenicity - Assessment	:	Weight of evidence does not support classification as a germ cell mutagen.

Fluthiacet-methyl:

Genotoxicity in vitro	:	Test Type: Ames test Metabolic activation: with and without metabolic activation Result: negative Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473
Genotoxicity in vivo	:	Test Type: Micronucleus test Species: Mouse Result: negative

propane-1,2-diol:

Genotoxicity in vitro	:	Test Type: reverse mutation assay Result: negative
Genotoxicity in vivo	:	Test Type: In vivo micronucleus test

Species: Mouse
Result: negative

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Genotoxicity in vitro	:	Test Type: reverse mutation assay Method: OECD Test Guideline 471 Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	:	Test Type: Bone marrow chromosome aberration. Species: Rat Application Route: inhalation (vapor) Result: negative

Carcinogenicity

Based on available data, the classification criteria are not met.

Product:

Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

Components:

Pyroxasulfone:

Species	:	Rat, male
Exposure time	:	2 Years
	:	2.2 mg/kg bw/day
Result	:	positive
Target Organs	:	Bladder
Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

Fluthiacet-methyl:

Species	:	Mouse, male
Application Route	:	Oral
LOAEL	:	10 mg/kg bw/day
Result	:	positive
Target Organs	:	Liver
Remarks	:	Likely to be carcinogenic to humans (US EPA)
Species	:	Rat, male
Application Route	:	Oral
LOAEL	:	130 mg/kg bw/day
Result	:	positive
Target Organs	:	Pancreas, pancreatic islet
Remarks	:	Likely to be carcinogenic to humans (US EPA)
Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in animal studies

propane-1,2-diol:

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

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Species	:	Rat, male and female
Application Route	:	inhalation (vapor)
Exposure time	:	12 month(s)
NOAEC	:	1.8 mg/l
Result	:	negative
Remarks	:	Based on data from similar materials

Carcinogenicity - Assessment	:	Not classifiable as a human carcinogen.

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

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 No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Suspected of damaging the unborn child.

Components:

Pyroxasulfone:

Fluthiacet-methyl:

Effects on fertility	:	Test Type: Two-generation study General Toxicity Parent: NOEL: 1.4 mg/kg bw/day Early Embryonic Development: NOEL: 36 mg/kg bw/day Method: OECD Test Guideline 416 GLP: yes
Reproductive toxicity - Assessment	:	Animal testing showed no reproductive toxicity.

propane-1,2-diol:

Effects on fertility	:	Test Type: reproductive and developmental toxicity study Species: Mouse Application Route: Oral Result: negative
Effects on fetal development	:	Test Type: Embryo-fetal development Species: Mouse Application Route: Oral

Method: OECD Test Guideline 414
Result: Animal testing did not show any effects on fertility.
Remarks: Based on data from similar materials

STOT-single exposure

Based on available data, the classification criteria are not met.

Components:

atrazine (ISO):

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

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:

atrazine (ISO):

Routes of exposure : Oral
Target Organs : Heart
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Pyroxasulfone:

Target Organs : Nervous system, Kidney, Liver, Cardio-vascular system, Bladder
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Repeated dose toxicity

Components:

Fluthiacet-methyl:

Species : Rat, male
NOAEL : 6.19 mg/kg
LOAEL : 216 mg/kg
Application Route : Oral
Exposure time : 90 d
Method : OECD Test Guideline 408
Target Organs : Liver

Species : Rat, male
LOAEL : 4.2 mg/kg
Application Route : Oral
Exposure time : 14 d

Method	:	OECD Test Guideline 407
GLP	:	yes
Target Organs	:	Liver

propane-1,2-diol:

Species	:	Rat, male and female
NOAEL	:	1,700 mg/kg
Application Route	:	Oral
Exposure time	:	2 Years

Species	:	Rat, male and female
NOAEL	:	1,000 mg/kg
LOAEL	:	160 mg/kg
Application Route	:	Inhalation
Exposure time	:	90 Days

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Species	:	Rat, male and female
NOAEC	:	0.9 - 1.8 mg/l
Application Route	:	inhalation (vapor)
Exposure time	:	12 Months

aluminium oxide:

Species	:	Rat, male and female
LOAEL	:	1,000 mg/kg
Application Route	:	Oral

Aspiration toxicity

Based on available data, the classification criteria are not met.

Components:

Fluthiacet-methyl:

The substance does not have properties associated with aspiration hazard potential.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

May be fatal if swallowed and enters airways.

Experience with human exposure

Components:

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Skin contact	:	Symptoms: Repeated exposure may cause skin dryness or cracking.

Further information

Product:

Remarks	:	No data available

Components:

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Remarks : Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Prolonged and/or repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

atrazine (ISO):

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): > 29 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 0.043 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 0.011 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Pyroxasulfone:

Toxicity to fish : LL50 (Oncorhynchus mykiss (rainbow trout)): > 202 mg/l
Exposure time: 96 h

LL50 (Lepomis macrochirus (Bluegill sunfish)): > 208 mg/l
Exposure time: 96 h

LL50 (Cyprinodon variegatus (sheepshead minnow)): > 3.3 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): > 4.4 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (green algae): 0.000743 mg/l
Exposure time: 72 h

EC50 (Lemna gibba (duckweed)): 0.00043 mg/l
Exposure time: 7 d

Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 2 mg/l Exposure time: 28 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 1.9 mg/l Exposure time: 21 d
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): > 997 mg/kg Exposure time: 14 d
Toxicity to terrestrial organisms	:	LD50 (Apis mellifera (bees)): > 100 µg/bee Exposure time: 48 d Remarks: Contact LOEC (Anas platyrhynchos (Mallard duck)): 60 mg/kg End point: Reproduction Test

Fluthiacet-methyl:

Toxicity to fish	:	LC50 (Cyprinodon variegatus (sheepshead minnow)): 0.15 - 0.17 mg/l Exposure time: 96 h Test Type: flow-through test LC50 (Cyprinus carpio (Carp)): 0.51 - 0.83 mg/l Exposure time: 96 h Method: EPA OPP 72-1
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Crustaceans): 2.3 mg/l Exposure time: 48 h Method: No information available. NOEC (Daphnia magna (Water flea)): 0.035 mg/l Exposure time: 21 d Test Type: flow-through test
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 0.00251 mg/l Exposure time: 72 h NOEC (Lemna gibba (duckweed)): 0.0017 mg/l Exposure time: 14 d IC50 (Lemna gibba (duckweed)): 0.0075 mg/l Exposure time: 14 d
Toxicity to fish (Chronic toxicity)	:	NOEC (Fish): 0.0027 mg/l Exposure time: 21 d Method: No data available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.035 mg/l Exposure time: 21 d

Toxicity to soil dwelling organisms	:	NOEC (Eisenia fetida (earthworms)): 948 mg/kg Method: OECD Test Guideline 207
Toxicity to terrestrial organisms	:	LC50 (Colinus virginianus (Bobwhite quail)): > 5,620 mg/kg Exposure time: 5 d Method: EPA OPP 71-2 (Avian Dietary Toxicity Test) LD50 (Apis mellifera (bees)): > 100 µg/bee Remarks: Contact

propane-1,2-diol:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 40,613 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	(Mysidopsis bahia (opossum shrimp)): 18,800 mg/l Exposure time: 96 h
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 34,100 mg/l Exposure time: 48 h Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 13,020 mg/l Exposure time: 7 d
Toxicity to microorganisms	:	EC50 (Pseudomonas putida): > 20,000 mg/l Exposure time: 18 h

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Toxicity to fish	:	LL50 (Oncorhynchus mykiss (rainbow trout)): 2 - 5 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 1.4 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EL50 (Pseudokirchneriella subcapitata (green algae)): 1 - 3 mg/l Exposure time: 24 h Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	EL50 (Daphnia magna (Water flea)): 0.89 mg/l Exposure time: 21 d Method: OECD Test Guideline 211
Toxicity to microorganisms	:	LL50 (Tetrahymena pyriformis): 677.9 mg/l Exposure time: 72 h Test Type: Growth inhibition

Persistence and degradability

Components:

atrazine (ISO):

Biodegradability : Inoculum: activated sludge, non-adapted
Result: Not biodegradable
Biodegradation: 9.86 %
Exposure time: 28 d

Pyroxasulfone:

Biodegradability : Result: Not readily biodegradable.

Fluthiacet-methyl:

Biodegradability : Result: Not readily biodegradable.

propane-1,2-diol:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 23.6 %
Exposure time: 64 d
Method: OECD Test Guideline 306

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 58.6 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
Remarks: Based on data from similar materials

Bioaccumulative potential

Components:

atrazine (ISO):

Partition coefficient: n-octanol/water : log Pow: 2.59 (68 °F / 20 °C)
pH: 7.31 - 7.51

Pyroxasulfone:

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 2.39 (77 °F / 25 °C)

Fluthiacet-methyl:

Bioaccumulation : Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3.77

propane-1,2-diol:

Partition coefficient: n-octanol/water : log Pow: -1.07

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Bioaccumulation : Remarks: The product/substance has a potential to bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3.72
Method: QSAR

Mobility in soil

Components:

Pyroxasulfone:

Distribution among environmental compartments : Adsorption/Soil
Koc: 57 - 114 ml/g, log Koc: > 1.75
Remarks: Highly mobile in soils

Stability in soil :

Fluthiacet-methyl:

Distribution among environmental compartments : Remarks: Slightly mobile in soils

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Distribution among environmental compartments : Remarks: Expected to partition to sediment and wastewater solids. Moderately volatile.

Other adverse effects

Product:

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

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

Disposal methods

Waste from residues : 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.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (atrazine, Pyroxasulfone, Fluthiacet-methyl)
Class	:	9
Packing group	:	III
Labels	:	9
Environmentally hazardous	:	yes

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (atrazine, Pyroxasulfone, Fluthiacet-methyl)
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. (atrazine, Pyroxasulfone, Fluthiacet-methyl)
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 Road

UN/ID/NA number	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (atrazine, Pyroxasulfone, Fluthiacet-methyl)

Class	:	9
Packing group	:	III
Labels	:	CLASS 9
ERG Code	:	171
Marine pollutant	:	yes

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

CERCLA Reportable Quantity

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

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS 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 : No SARA Hazards

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

atrazine (ISO)	1912-24-9	>= 30 - < 50 %
aluminium oxide	1344-28-1	>= 1 - < 5 %

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):

propane-1,2-diol	57-55-6	>= 5 - < 10 %

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

acetic acid	64-19-7	>= 0.1 - < 1 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

acetic acid	64-19-7	>= 0.1 - < 1 %

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

atrazine (ISO)	1912-24-9
aluminium oxide	1344-28-1

Pennsylvania Right To Know

atrazine (ISO)	1912-24-9
water	7732-18-5
propane-1,2-diol	57-55-6
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5
Pyroxasulfone	447399-55-5
aluminium oxide	1344-28-1
acetic acid	64-19-7

Maine Chemicals of High Concern

octamethylcyclotetrasiloxane [D4]	556-67-2

Vermont Chemicals of High Concern

octamethylcyclotetrasiloxane [D4]	556-67-2

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

WARNING: This product can expose you to chemicals including atrazine (ISO), which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

atrazine (ISO)	1912-24-9
aluminium oxide	1344-28-1

California Permissible Exposure Limits for Chemical Contaminants

atrazine (ISO)	1912-24-9
aluminium oxide	1344-28-1

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

TCSI	:	Not 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 chemical substance(s) exempt from CEPA DSL Inventory requirements. It is regulated as a pesticide subject to Pest Control Products Act (PCPA) requirements. Read the PCPA label, authorized under the Pest Control Products Act, prior to using or handling this pest control product.
ENCS	:	Not in compliance with the inventory
ISHL	:	Not in compliance with the inventory

KECI	:	Not 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

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

FIFRA 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:

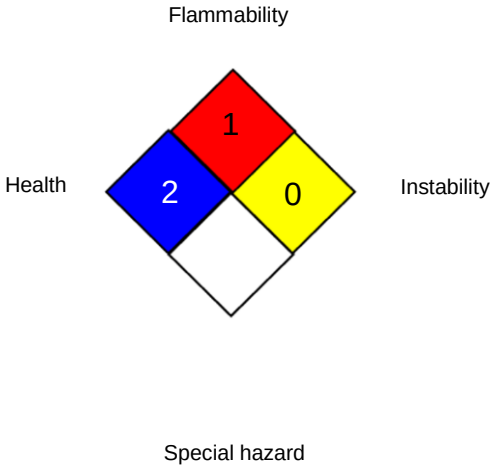
WARNING

May be fatal if swallowed, Harmful if absorbed through the skin., Avoid contact with skin, eyes and clothing., Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

SECTION 16. OTHER INFORMATION

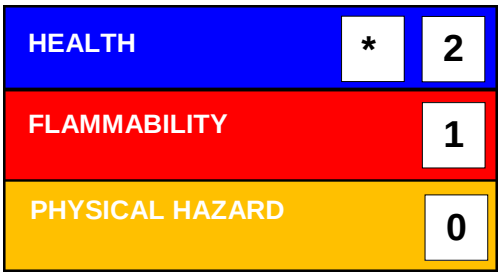
Further information

NFPA 704:



0 No health threat, **1** Slightly Hazardous, **2** Hazardous, **3** Extreme danger, **4** Deadly

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
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
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 Prevention 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

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Prepared by:

Tenkoz, Inc.

End of Material Safety Data Sheet