

Monsanto Canada
Safety Data Sheet
Commercial Product

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Product identifier

Tioxazafen Technical

1.1.1. Chemical name
3-Phenyl-5-(2-thienyl)-1,2,4-oxadiazole

1.1.2. Synonyms
MON 102100

1.1.3. PCP Reg. No.
32774

1.2. Product use
Nematacide

1.3. Company
Monsanto Canada, 900 - One Research Road, Winnipeg, MB, R3T 6E3
Telephone: 204-985-1000 or 800-667-4944, **Fax:** 204-488-9599
E-mail: safety.datasheet@monsanto.com

1.4. Emergency numbers
FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT Call
CANUTEC - Day or Night: 613-996-6666 (collect calls accepted) or MONSANTO: 314-694-4000
(collect calls accepted).
FOR MEDICAL EMERGENCY - Day or Night: +1 (314) 694-4000 (collect calls accepted).

2. HAZARDS IDENTIFICATION

2.1. Classification
Classification according to the Hazardous Products Regulations, 2015 Workplace Hazardous Materials Information System (WHMIS 2015)
Skin corrosion/irritation - Category 2
Skin sensitization - Category 1
STOT RE - Category 2

2.2. Label elements
Hazard pictogram/pictograms



Signal word

WARNING!

Hazard statement/statements

- H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H373 May cause damage to adrenals through prolonged or repeated exposure.

Precautionary statement/statements

- P260 Do not breathe dust/mist/vapours/spray.
P280 Wear protective gloves
P264 Wash thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.

P302+352 IF ON SKIN: Wash with plenty of soap and water.
P362 Take off contaminated clothing and wash before reuse.
P333+313 If skin irritation or rash occurs: get medical advice/attention.
P363 Wash contaminated clothing before reuse.
P314 Get medical advice/attention if you feel unwell.
P501 Dispose of contents/container in accordance with local regulation.

2.3. Other hazards

May form combustible dust concentrations in air.

2.3.1. Potential other effects

Risk of dust explosion.

2.4. Appearance and odour (colour/form/odour)

Cream-Light grey /Solid / Faint aromatic

Refer to section 11 for toxicological and section 12 for environmental information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance: Not applicable.

3.2. Mixture: Yes.

Composition/information on ingredients

Components	CAS No.	Concentration
Tioxazafen	330459-31-9	82.38 %
Other ingredients		17.62 %

Active ingredient

3-phenyl-5-(2-thienyl)- 1,2,4-oxadiazole; {Tioxazafen}

4. FIRST AID MEASURES

Use personal protection recommended in section 8.

4.1. Description of first aid measures

4.1.1. Eye contact

If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.

4.1.2. Skin contact

Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes.
Call a poison control center or doctor for treatment advice.

4.1.3. Inhalation

If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

4.1.4. Ingestion

Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison center or doctor. Do not give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

4.2.1. Potential health effects

Likely routes of exposure: Skin contact, eye contact, inhalation

Eye contact, short term: Not expected to produce significant adverse effects when recommended use instructions are followed.

Skin contact, short term: Causes skin irritation. May cause allergic skin reaction.

Inhalation, short term: Not expected to produce significant adverse effects when recommended use instructions are followed.

Single ingestion: Not expected to produce significant adverse effects when recommended use instructions are followed.

4.2.2. Medical conditions aggravated by exposure:

None.

4.3. Indication of any immediate medical attention and special treatment needed

Not applicable.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

5.1.1. Recommended: Water, Dry chemical, Foam, Carbon dioxide (CO₂)

5.2. Special hazards

5.2.1. Unusual fire and explosion hazards

This material as normally packaged and handled can contain sufficient fines to form an explosive mixture if dispersed in a sufficient quantity of air. Environmental precautions: see section 6.

5.2.2. Hazardous products of combustion

Carbon monoxide (CO), Carbon dioxide (CO₂), Nitrogen oxides (NO_x), Sulphur oxides (SO_x)

5.3. Advice for firefighters

Self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

5.4. Flash point

Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

6.1. Personal precautions

Do not breathe dust.

6.2. Environmental precautions

Keep out of drains, sewers, ditches and water ways. Do NOT contaminate water when disposing of rinse waters.

6.3. Methods for cleaning up

Collect in containers for reclamation or disposal. Use vacuum equipment designed specifically for combustible dust. Wash spill area with detergent and water.

Refer to section 13 for disposal of spilled material.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Good industrial practice in housekeeping and personal hygiene should be followed. Avoid contact with eyes, skin and clothing. Avoid breathing dust. When using do not eat, drink or smoke. Wash hands thoroughly after handling or contact. Wash contaminated clothing before re-use. Refer to section 13 of the safety data sheet for disposal of rinse water. Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.

Emptied packages retain product residue and dust. FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

7.2. Conditions for safe storage, including any incompatibilities

Keep out of reach of children. Keep away from food, drink and animal feed. Keep container dry. Keep only in the original container. Keep aqueous solutions away from direct sunlight.

7.3. Specific end use(s)

Not applicable.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Airborne exposure limits

Components	Exposure Guidelines
Tioxazafen	No specific occupational exposure limit has been established.
Other ingredients	No specific occupational exposure limit has been established.

8.2. Exposure controls

Engineering controls

Provide local exhaust ventilation.

Eye protection:

If there is significant potential for contact: Wear chemical goggles.

Skin protection:

Wear chemical resistant gloves.

Wear chemical resistant clothing/footwear. If there is significant potential for contact: Wear face shield.

Respiratory protection:

No special requirement when used as recommended. If airborne exposure is excessive: Wear respirator.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

9.1 Information on basic physical and chemical properties

Colour/colour range:	Cream - Light grey
Form:	Solid
Odour:	Faint aromatic
Odour threshold:	Not available.
Physical form changes (melting, boiling, etc.):	
Melting point:	108.6 °C
Boiling point:	Not applicable.
Flash point:	Not applicable.
Explosive properties:	Upper explosion limit: No data.; Lower explosion limit: No data. Minimum ignition energy (MIE): < 3 mJ Minimum ignition temperature (cloud): 550 - 560 °C Minimum ignition temperature (layer): > 400 °C Maximum pressure (Pmax): 9 bar; K(st): > 300 bar-m/s
Auto ignition temperature:	No data.
Self-accelerating decomposition temperature (SADT):	No data.
Oxidizing properties:	No data.
Specific gravity:	Not applicable.
Vapour pressure:	0.0000775 Pa @ 25 °C
Vapour density:	No data.
Dynamic viscosity:	Not applicable.
Kinematic viscosity:	Not applicable.
Density:	0.35 - 0.50 g/cm ³
Solubility:	Water: 1.24 mg/l @ 20 °C Organic solvents: Soluble
pH:	6.3 @ 22.3 °C
Partition coefficient:	log Pow: 4.13 @ 20 °C

9.2 Other information

Evaporation rate:	Not applicable.
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10. STABILITY AND REACTIVITY

10.1 Reactivity

Risk of dust explosion.

10.2 Chemical stability

Stable under normal conditions of handling and storage. Keep aqueous solutions away from direct sunlight.

- 10.3. Possibility of hazardous reactions**
Risk of dust explosion.
- 10.4. Conditions to avoid**
None
- 10.5. Incompatible materials**
Compatible materials for storage: see section 7.2.
- 10.6. Hazardous decomposition products**
Hazardous products of combustion: see section 5.

11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

11.1. Information on toxicological effects

Acute oral toxicity: Based on available data classification criteria are not met.

Acute dermal toxicity: Based on available data classification criteria are not met.

Acute inhalation toxicity: Based on available data classification criteria are not met.

Skin corrosion/irritation: Category 2

Eye corrosion/irritation: Based on available data classification criteria are not met.

Skin sensitization: Category 1

Respiratory sensitization: Based on available data classification criteria are not met.

Mutagenicity: Based on available data classification criteria are not met.

Carcinogenicity: Based on available data classification criteria are not met.

Reproductive/Developmental Toxicity: Based on available data classification criteria are not met.

Specific Target Organ Toxicity - Single Exposure: Based on available data classification criteria are not met.

Specific Target Organ Toxicity - Repeated Exposure: Category 2

Aspiration hazard: Based on available data classification criteria are not met.

Most important symptoms and effects, both acute and delayed

Potential health effects

Likely routes of exposure: Skin contact, eye contact, inhalation

Eye contact, short term: Not expected to produce significant adverse effects when recommended use instructions are followed.

Skin contact, short term: Causes skin irritation. May cause allergic skin reaction.

Inhalation, short term: Not expected to produce significant adverse effects when recommended use instructions are followed.

Single ingestion: Not expected to produce significant adverse effects when recommended use instructions are followed.

Medical conditions aggravated by exposure: None.

Data obtained on product are summarized below.

Tioxazafen

Acute oral toxicity

Rat, female, LD50: > 5,000 mg/kg body weight
No mortality. Practically non-toxic.

Acute dermal toxicity

Rat, LD50: > 5,000 mg/kg body weight

No mortality. Practically non-toxic.

Skin irritation

Rabbit, :

No skin irritation.

Eye irritation

Rabbit, :

Slight irritation.

Acute inhalation toxicity

Rat, LC50, 4 hours, dust: > 5.21 mg/L

No mortality. Practically non-toxic.

Skin sensitization

Mouse, local lymph node assay (LLNA):

Positive.

Genotoxicity

Not genotoxic.

Repeated dose toxicity

Target organs/systems: Rat; adrenals

Target organs/systems: Rat; bone; Based on available data classification criteria are not met.

Target organs/systems: Mouse; liver; Based on available data classification criteria are not met.

Carcinogenicity

Not carcinogenic in rats.

Liver tumors and possibly other tumors in mice above the MTD; questionable relevance to humans.

Reproductive/Developmental Toxicity

No reproductive effects in rats. Developmental effects in rats and rabbits only in the presence of significant maternal toxicity.

EXPERIENCE WITH HUMAN EXPOSURE

Skin contact, short term, occupational:

Skin effects: irritation, redness

12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on active ingredient(s) are summarized below.

12.1 Toxicity

No data.

12.2 Persistence and degradability

No data.

12.3 Bioaccumulative potential

Refer to section 9 for partition coefficient data.

12.4 Mobility in soil

No data.

12.5 Results of PBT and vPvB assessment

No data.

12.6 Other adverse effects

No data.

12.7 Additional information

If available, data obtained on similar products and/or on components are summarized below.

Tioxazafen

Aquatic toxicity, fish

Rainbow trout (*Oncorhynchus mykiss*):

Acute toxicity, 96 hours, semi-static, LC50: 0.076 mg/L

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):

Acute toxicity, 48 hours, static, EC50: > 1.2 mg/L

Aquatic toxicity, algae/aquatic plants

Diatom (*Navicula sp.*):

Acute toxicity, 96 hours, static, EbC50 (biomass): 0.047 mg/L

Arthropod toxicity

Honey bee (*Apis mellifera*):

Contact, 48 hours, LD50: > 100 µg/bee

Bioaccumulation

Bluegill sunfish (*Lepomis macrochirus*):

Whole fish: BCF: ~ 1,181
potential to bioaccumulate.

Dissipation

Soil, aerobic, 20 °C:

Half life: 22 - 237 days
Koc: 2,970 - 10,100 L/kg

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

13.1.1. Product

Keep out of drains, sewers, ditches and water ways. Recycle if appropriate facilities/equipment available. Burn in proper incinerator. Follow all local/regional/national/international regulations.

13.1.2. Container

Emptied packages retain product residue and dust. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. Empty packaging completely. Triple or pressure rinse empty containers. Do NOT contaminate water when disposing of rinse waters. Ensure packaging cannot be reused. Do NOT re-use containers. Recycle if appropriate facilities/equipment available. Follow all local/regional/national/international regulations.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Note

This product in single or combination packaging with a net quantity per single or inner packaging of 5 kilograms or less are not regulated for transport. Applies ONLY to non-bulk shipments.

Transport of Dangerous Goods Regulations (TDG)

14.1 UN No.: Not applicable.

14.2 Proper Shipping Name (Technical Name if required): Not regulated for domestic ground transportation.

- 14.3 **Transport hazard class: Not applicable.**
- 14.4 **Packing Group:** Not applicable.
- 14.5 **Environmental hazards: This material meets the definition of a marine pollutant.**
- 14.6 **Special precautions for the user:** Not applicable.

IMO

- 14.1 **UN No.:** Not applicable.
- 14.2 **Proper Shipping Name (Technical Name if required):** Not applicable.
- 14.3 **Transport hazard class: Not applicable.**
- 14.4 **Packing Group:** Not applicable.
- 14.5 **Environmental hazards: This material meets the definition of a marine pollutant.**
- 14.6 **Special precautions for the user:** Not applicable.
- 14.7 **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:** Not applicable.

Note: Use description for ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

IATA/ICAO

- 14.1 **UN No.:** Not applicable.
- 14.2 **Proper Shipping Name (Technical Name if required):** Not applicable.
- 14.3 **Transport hazard class: Not applicable.**
- 14.4 **Packing Group:** Not applicable.
- 14.5 **Environmental hazards: This material meets the definition of a marine pollutant.**
- 14.6 **Special precautions for the user:** Not applicable.

Note: Use description for ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

15. REGULATORY INFORMATION

15.1. Pest Management Regulatory Agency, Pest Control Products Act [PMRA PCPA]

PCPA registered.

16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.

Follow all local/regional/national/international regulations.

Please consult supplier if further information is needed.

In this document the British spelling was applied.

|| Significant changes versus previous edition.

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), STOT SE (Specific Target Organ Toxicity, Single Exposure), STOT RE (Specific Target Organ Toxicity, Repeated Exposure), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

<p>This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE Pest Management Regulatory (PMRA)- APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling</p>
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large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products are regulated by product labeling and provincial legislation, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the PMRA-approved label.

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