MATERIAL SAFETY DATA SHEET

Syngenta Crop Protection Canada, Inc.
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In Case of Emergency, Call
1-800-327-8633 (FAST MED)

Date of MSDS Preparation (Y/M/D): 2008-12-31

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MSDS prepared by:
Department of Regulatory & Biology Development
Syngenta Crop Protection Canada, Inc.

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SECTION – 1: PRODUCT IDENTIFICATION

Product Identifier: **BROADBAND® Herbicide** Formulation No.: A15351A
Registration Number: 29138 (Pest Control Products Act)
Chemical Class: Herbicidal Blend.

Active Ingredient (%): Pinoxaden Technical (9.0%) CAS No.: 243973-20-8
Chemical Name: Propanoic acid, 2,2-dimethyl-,8-(2,6-diethyl-4-methylphenyl)-1,2,4,5-tetrahydro-7-oxo-7H-pyrazolo[1,2-d][1,4,5]oxadiazepin-9-yl ester

Active Ingredient (%): Florasulam Technical (0.75%) CAS No.: 145701-23-1
Chemical Name: 2',6',8-trifluoro-5-methoxy[1,2,4]triazolo[1,5-c]pyrimidine-2-sulfonanilide

Product Use: For use in Spring Wheat and Barley. . Please refer to product label for further details.

SECTION – 2 : COMPOSITION/INFORMATION ON INGREDIENTS

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen	WHMIS†
Petroleum Solvent	Not Established	Not Established	100 mg/m³ (15 ppm) TWA*	No	Not Established
Cloquintocet-Mexyl (2.25%)	Not Established	Not Established	10 mg/m³ TWA ***	No	Not Established
Tetrahydrofurfuryl Alcohol (THFA)	Not Established	Not Established	2 ppm (TWA) ****	No	Not Established
Pinoxaden Technical	Not Established	Not Established	Not Established	No	Not Established
Florasulam Technical	Not Established	Not Established	Not Established	No	Not Established

* Recommended by Manufacturer
*** Syngenta Occupational Exposure Limit (OEL)
**** Recommended by AIHA (American Industrial Hygiene Association)
† Material listed in Ingredient Disclosure List under Hazardous Products Act.

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

SECTION – 3: HAZARDS IDENTIFICATION

Symptoms of Acute Exposure

Irritating to eyes and skin. Vapors may cause drowsiness and dizziness.

Hazardous Decomposition Products

Can decompose at high temperatures and form toxic gases.

Physical Properties

Appearance: Liquid
Odour: Aromatic

Unusual Fire, Explosion and Reactivity Hazards

Combustible liquid. Can release vapours that form explosive mixtures at temperatures at, or above, the flash point. Heavy vapours can flow along surfaces to distant ignition sources and flash back. During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

Potential Health Effects

Relevant routes of exposure: Skin, eyes, mouth, lungs.

SECTION – 4: FIRST AID MEASURES

IF POISONING IS SUSPECTED, immediately contact the poison information centre, doctor or nearest hospital. Have the product container, label or Material Safety Data Sheet with you when calling Syngenta, a poison control center or doctor, or going for treatment. Tell the person contacted the complete product name, and the type and amount of exposure. Describe any symptoms and follow the advice given. Call the Syngenta Emergency Line [**1-800-327-8633** (**1-800-FASTMED**)], for further information.

EYE CONTACT:	Flush eyes with clean water, holding eyelids apart for a minimum of 20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta, a poison control center or doctor for treatment advice. Obtain medical attention immediately if irritation persists.
SKIN CONTACT:	Immediately remove contaminated clothing and wash skin, hair and fingernails thoroughly with soap and water. Flush skin with plenty of water for 15-20 minutes. Call Syngenta, a poison control centre or doctor for treatment advice.
INHALATION:	Move victim to fresh air. If not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call Syngenta, a poison control centre or doctor for treatment advice.
INGESTION:	If swallowed, immediately contact Syngenta, a poison control centre, doctor or nearest hospital for treatment advice. Do not induce vomiting unless directed by a physician or a poison control center. Do not give **any** liquid to the person. Call Syngenta, a poison control centre or doctor for treatment advice.

NOTES TO PHYSICIAN:
There is no specific antidote if this product is ingested. Treat symptomatically. Contains petroleum distillate - vomiting may cause aspiration pneumonia.

MEDICAL CONDITIONS KNOWN TO BE AGGRAVATED:

None known.

SECTION – 5: FIRE FIGHTING MEASURES

Flash point and method: 77 °C (Pensky-Martens CC)
Upper and lower flammable (explosive) limits in air: Not applicable.
Auto-ignition temperature: 295 ºC.
Flammability: Combustible liquid.

Hazardous combustion products: Combustible liquid. Can release vapours that form explosive mixtures at temperatures at, or above, the flash point. Heavy vapours can flow along surfaces to distant ignition sources and flash back. During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.
Conditions under which flammability could occur: Keep fire exposed containers cool by spraying with water.
Extinguishing media: Use foam, carbon dioxide, dry powder, halon extinguishant or water fog or mist, (avoid use of water jet). Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. Contain run-off water with, for example, temporary earth barriers.
Sensitivity to explosion by mechanical impact: None known.
Sensitivity to explosion by static discharge: None known.

SECTION – 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Make sure all personnel involved in the spill cleanup follow good industrial hygiene practices. A small spill can be handled routinely. Wear suitable protective clothing and eye protection to prevent skin and eye contact. Use adequate ventilation and wear equipment and clothing as described in Section 8 and/or the product label.
Procedures for dealing with release or spill: Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Sections 7 and 8. Scoop or sweep up material, keeping dust to a minimum, and place into a disposable container. Wash area with detergent and water. Pick up wash liquid with additional absorbent and place into compatible disposal container. On soils, small amounts will naturally decompose. For large amounts, skim off the upper contaminated layer and collect for disposal. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposal. Spillages or uncontrolled discharges into watercourses must be reported to the appropriate regulatory authority.

SECTION – 7: HANDLING AND STORAGE

Handling practices: KEEP OUT OF REACH OF CHILDREN. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. After work, rinse gloves and remove protective equipment, and wash hands thoroughly with soap and water after handling, and before eating, tobacco use, drinking, applying cosmetics or using the toilet. Wash contaminated clothing before re-use and separate from household laundry. Keep containers closed when not in use. Protect product, wash or rinse water, and contaminated materials from uncontrolled release into the environment, or from access by animals, birds or unauthorized people.
Appropriate storage practices/requirements: Store in original container only in a well-ventilated, cool, dry, secure area. Protect from heat, sparks and flame. Do not expose sealed containers to temperatures above 40 °C. Keep separate from other products to prevent cross contamination. Rotate stock. Clean up spilled material immediately.
National Fire Code classification: Not applicable.

SECTION – 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Applicable control measures, including engineering controls: If necessary, ensure work areas have ventilation, containment, and procedures sufficient to maintain airborne levels to a minimum. Warehouses, production area, parking lots and waste holding facilities must have adequate containment to prevent environmental contamination. Provide separate shower and eating facilities.

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT.

CONSULT THE PRODUCT LABEL FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS.

Personal protective equipment for each exposure route:
General: Avoid breathing dust, vapours or aerosols. Avoid contact with eye, skin and clothing. Wash thoroughly after handling and before eating, drinking, applying cosmetics or handling tobacco.
INGESTION: Do not eat, drink, handle tobacco, or apply cosmetics in areas where there is a potential for exposure to this material. Always wash thoroughly after handling.

EYES: Where eye contact is likely, use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

SKIN: Where contact is likely, wear chemical-resistant gloves (such as nitrile or butyl), coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.

INHALATION: A respirator is not normally required when handling this substance. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below exposure limits. A NIOSH-certified combination air-purifying respirator with an N, P or R 95 or HE class filter and an organic vapour cartridge may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a pressure demand atmosphere-supplying respirator if there is any potential for uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

SECTION – 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid.
Formulation Type: Emulsifiable concentrate.
Odour: Aromatic.
pH: 4.6 (1% aqueous solution @ 25 ºC).

Vapour pressure and reference temperature:	Pinoxaden Technical:	3.5×10^{-9} mmHg @ 25 ºC.
	Florasulam Technical:	7.5×10^{-8} mmHg @ 20 ºC.

Vapour density: Not applicable.
Boiling point: Not Available.
Melting point: Not Available.
Freezing point: Not Available.
Specific gravity or density: 1.03 g/cm^3.
Evaporation Rate: Not available.
Water/oil partition coefficient: Not available.
Odour threshold: Not available.
Viscosity: Not applicable.

Solubility in Water:	Pinoxaden Technical:	200 mg/L @ 25 ºC.
	Florasulam Technical:	121 mg/L @ 20°C.

SECTION – 10: STABILITY AND REACTIVITY

Chemical stability: Stable under normal use and storage conditions.
Conditions to avoid: None known.
Incompatibility with other materials: None known.
Hazardous decomposition products: Can decompose at high temperatures and form toxic gases.
Hazardous polymerization: Will not occur.

SECTION – 11: TOXICOLOGICAL INFORMATION

Acute toxicity/Irritation Studies (Finished Product):

Ingestion:	Low Acute Toxicity	
	Oral (LD50 Female Rat):	3,129 mg/kg body weight
Dermal:	Low Acute Toxicity	
	Dermal (LD50 Rat):	> 5,050 mg/kg body weight
Inhalation:	Low Acute Toxicity	
	Inhalation (LC50 Rat):	> 2.61 mg/L air - 4 hours
Eye Contact:	Moderately Irritating (Rabbit)	

Skin Contact: Slightly Irritating (Rabbit)

Skin Sensitization: Not a Sensitizer (Guinea Pig)

Reproductive/Developmental Effects

Pinoxaden Technical:

Teratogenicity: Not teratogenic in rats or rabbits.
Reproduction: No reproductive effects observed.

Florasulam Technical:

Teratology (Birth Defects): Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects to the mother.
Reproductive Effects: Did not interfere with reproduction in laboratory animal studies.
Mutagenicity: In-vitro and animal genetic toxicity studies were negative.

Chronic/Subchronic Toxicity Studies

Pinoxaden Technical:

Subchronic:	Predominantly kidney and liver effects at high doses.
Chronic:	Predominantly kidney and liver effects at high doses.
Neurotoxicity:	No neurotoxic effects (acute or subchronic).

Florasulam Technical:

Not Available.

Carcinogenicity

Pinoxaden Technical:

No compound-related tumours in rats or mice.

Florasulam Technical:

Did not cause cancer in laboratory animals.

Other Toxicity Information:

None.

Toxicity of Other Components

Petroleum Solvent:

Inhalation of vapours at high concentrations can cause central nervous system (CNS) effects (e.g. dizziness, headache, etc.), irritation to eyes or respiratory tract.

Cloquintocet-Mexyl:

Causes mild eye and skin irritation. May be harmful if inhaled. Allergic skin reactions are possible.

Tetrahydrofurfuryl Alcohol (THFA):

Inhalation of vapours at high concentrations can cause central nervous system effects (dizziness, headache), irritation to eyes or respiratory tract. Chronic overexposure may affect the kidney.

Other materials that show synergistic toxic effects together with the product: None known.

Target Organs

Active Ingredient

Pinoxaden Technical:	Kidney.
Florasulam Technical:	Kidney, liver.

Inert Ingredients

Cloquintocet-Mexyl:	Eye, skin, lung, digestive tract.
Petroleum Solvent:	Respiratory tract, stomach, liver, thyroid, urinary bladder, CNS, skin.
Tetrahydrofurfuryl Alcohol (THFA):	CNS, kidney.

SECTION – 12: ECOLOGICAL INFORMATION

Summary of Effects

BROADBAND is an herbicide that is applied as a spray for broad-spectrum control of grasses in spring wheat and barley. The active ingredient, pinoxaden, is non-toxic to birds and insects (bees) and slightly toxic to aquatic organisms. The active ingredient, florasulam, is practically non-toxic to insects (bees), aquatic invertebrates (water flea), fish, and is non-toxic to slightly toxic to birds.

Eco-Acute Toxicity

Pinoxaden Technical:

Blue-green Algae 96-hr EC_{50}	3.3 ppm
Bees LC_{50}/EC_{50} (Contact)	> 100 µg/bee
Invertebrates (Water Flea) LC_{50}/EC_{50}	52 ppm
Fish (Trout) 96-hr LC_{50}/EC_{50}	12 ppm
Fish (Fathead) 96-hr LC_{50}/EC_{50}	20 ppm
Birds (8-day Dietary - Bobwhite Quail) LC_{50}/EC_{50}	> 5,970 ppm
Birds (8-day Dietary - Mallard Duck) LC_{50}/EC_{50}	> 5,970 ppm

Florasulam Technical:

Green Algae 96-hr EC_{50}	Not available
Bees LC_{50}/EC_{50} (Contact)	> 100 µg/bee
Invertebrates (Water Flea) LC_{50}/EC_{50}	> 292 ppm
Fish (Trout) 96-hr LC_{50}/EC_{50}	> 100 ppm
Fish (Bluegill) 96-hr LC_{50}/EC_{50}	> 100 ppm
Birds (8-day Dietary - Japanese Quail) LC_{50}/EC_{50}	> 5,000 ppm
Birds (8-day Dietary - Mallard Duck) LC_{50}/EC_{50}	> 5,000 ppm

Eco-Chronic Toxicity

Pinoxaden Technical:

Invertebrates (Water Flea) 21-day NOEC	5.87 ppm
Fish (Trout) 21-day NOEC	1.0 ppm

Florasulam Technical:

Invertebrates (Water Flea) 21-Day NOEC	169.2 ppm
Fish (Trout) 28-Day NOEC	119 ppm

Environmental Fate

Pinoxaden has a low bioaccumulation potential, low mobility, and low persistence in soil and water. The Dissipation half-life in water is < 1 day and in soil is 0.2 – 5 days. The main route of degradation is by microbial transformation and formation of bound residues in soils. In water, hydrolysis is the significant transformation pathway for pinoxaden.

Florasulam has a half-life in soils that is dependent on soil type and conditions and is approximately 2-18 days. Degradation is microbially mediated and occurs readily, dependent on conditions. There is no evidence of any significant leaching, therefore it is unlikely to contaminate ground water. Average half-life in water is 9-29 days.

SECTION – 13: DISPOSAL CONSIDERATIONS

Waste disposal information: Do not reuse empty containers unless they are specifically designed to be re-filled. Empty container retains product residue. Dispose of empty containers in accordance with local regulations. Consult provincial environment ministry for advice on waste disposal. Industrial/commercial waste may be handled at licensed facilities only. Waste shipments must be securely packaged and properly labelled. Only licensed carriers may be used, and proper documents must accompany the shipment.

SECTION – 14 : TRANSPORT INFORMATION

Shipping information such as shipping classification:

TRANSPORTATION OF DANGEROUS GOODS CLASSIFICATION - ROAD/RAIL
Not Regulated.

SECTION – 15: REGULATORY INFORMATION

WHMIS classification for product: Exempt

A statement that the MSDS has been prepared to meet WHMIS requirements, except for use of the 16 headings.
This MSDS has been prepared in accordance with WHMIS requirements, but the data are presented under 16 headings.

Other regulations; restrictions and prohibitions

Pest Control Products (PCP) Act Registration No.: 29138

SECTION – 16: OTHER INFORMATION

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Syngenta will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years. This product is under the jurisdiction of the Pest Control Products Act and is exempt from the requirements for a WHMIS compliant MSDS. Hazardous properties of all ingredients have been considered in the preparation of this MSDS. Read the entire MSDS for the complete hazard evaluation of this product.

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