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**In Case of Emergency, Call
1-800-327-8633 (FAST MED)**

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MSDS prepared by:

Department of Regulatory & Biology Development
Syngenta Crop Protection Canada, Inc.

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1-87-SYNGENTA (1-877-964-3682)

SECTION – 1: PRODUCT IDENTIFICATION

Product Identifier: ASTOUND® Fungicide

Formulation No.: A9219B

Registration Number: 29648 (Pest Control Products Act)

Chemical Classes: A mixture of pyrimidine derivative and substituted benzodioxalcarbonitrile fungicides.

Synonym: None

Active Ingredient (%): Cyprodinil (37.5 %)

CAS No.: 121552-61-2

Chemical Name: 4-Cyclopropyl-6-methyl-N-phenylpyrimidiamine.

Chemical Class: A pyrimidine derivative fungicide.

Active Ingredient (%): Fludioxonil (25.0 %)

CAS No.: 131341-86-1

Chemical Name: 4-(2,2-difluoro-1,3-benzodioxol-4-yl)-1H-pyrrole-3-carbonitrile.

Chemical Class: Substituted benzodioxalcarbonitrile fungicide

Product Use:

Astound is water dispersible solid granular fungicide that is mixed with water and sprayed on canola for the control of certain diseases. For further details please refer to product label.

SECTION – 2 : COMPOSITION/INFORMATION ON INGREDIENTS

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen	WHMIS†
Diatomaceous Earth (CAS No. 61790-53-2)	80 mg/m ³ /%SiO ₂ (20 mppcf) TWA	Not Established	6 mg/m ³ TWA (respirable) **	IARC 3	Not Established
Crystalline Silica, Quartz (CAS # 14808-60-7)	10 mg/m ³ / (%SiO ₂ +2) (respirable dust)	0.025 mg/m ³ (respirable silica)	0.05 mg/m ³ (respirable dust)**	IARC 1; ACGIH A2	Yes
Sodium Sulphate (CAS No. 7757-82-6)	Not Established	Not Established	15 mg/m ³ TWA (total dust)	No	Not Established
Fludioxonil (25.0 %)	Not Established	Not Established	10 mg/m ³ TWA***	No	Not Established
Cyprodinil (37.5%)	Not Established	Not Established	7 mg/m ³ TWA***	No	Not Established

** Recommended by NIOSH

*** Syngenta Occupational Exposure Limit (OEL)

† 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

May be irritating to eyes, skin and respiratory tract.

Hazardous Decomposition Products

Can decompose at high temperatures and form toxic gases.

Physical Properties

Appearance: Gray to brown granules
Odour: Weak, uncharacteristic

Unusual Fire, Explosion and Reactivity Hazards

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.

Adverse health effects from exposure to product or ingredients of product:

May be mildly irritating via ocular, dermal and inhalation routes. Product is of low toxicity via the ingestion route however, medical attention should be sought.

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. Treat symptomatically. If a large amount has been swallowed and emesis has been inadequate, lavage stomach.

MEDICAL CONDITIONS KNOWN TO BE AGGRAVATED:

Asthma or other respiratory conditions may be aggravated by chemical irritants.

SECTION – 5: FIRE FIGHTING MEASURES

Flash point and method: Not applicable.

Upper and lower flammable (explosive) limits in air: Not applicable.

Auto-ignition temperature: Not available.

Flammability: Not highly flammable. Substance can be ignited, but the flame doesn't spread out.

Hazardous combustion products: During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

Conditions under which flammability could occur: None known.

Extinguishing media: Use foam, carbon dioxide, dry powder or halon extinguishant (avoid use of water). 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: No.

Sensitivity to explosion by static discharge: No.

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. See Section 8 for personal protective clothing and equipment

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 and place into a disposal container. Wash area with detergent and water. Pick up wash liquid with additional absorbent and place into compatible disposal container. On soils, 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. Avoid exposure to dust. 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. Wash hands thoroughly with soap and water after handling, and before eating, tobacco use, drinking, 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. Protect from sun and humidity. 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: This product is intended for use outdoors where engineering controls are not necessary. If necessary, ensure work areas have ventilation, containment, and procedures sufficient to maintain airborne levels below the TLV. 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 with soap and water after handling and before eating, drinking, 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 (such as nitrile or butyl) gloves, 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: Gray to brown granules.

Formulation Type: Solid.

Odour: Weak, uncharacteristic.

pH: 9.3 (1% aqueous solution).

Vapour pressure and reference temperature: 3.8 x 10⁻⁶ mmHg @ 25 °C (Cyprodinil Technical)
2.9 x 10⁻⁹ mmHg @ 25 °C (Fludioxonil Technical)

Vapour density: Not available.

Boiling point: Not applicable.

Melting point: 199.4 °C.

Freezing point: Not applicable.

Specific gravity or density: 0.54 g/cm³.

Evaporation Rate: Not available.

Water/oil partition coefficient: Not available.

Odour threshold: Not available.

Viscosity: Not applicable.

Solubility in Water: Cyprodinil Technical: 12 mg/L @ 20 °C
Fludioxonil Technical: 1.8 mg/L @ 25 °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:	<u>Practically Non-Toxic</u>	
	Oral (LD50 Rat):	> 5,000 mg/kg body weight
Dermal:	<u>Slightly Toxic</u>	
	Dermal (LD50 Rabbit):	> 2,000 mg/kg body weight

Inhalation:	<u>Practically Non-Toxic</u>	
	Inhalation (LC50 Rat):	> 2.51 mg/L air - 4 hours
Eye Contact:	<u>Minimally Irritating (Rabbit)</u>	
Skin Contact:	<u>Slightly Irritating (Rabbit)</u>	
Skin Sensitization:	<u>Not a Sensitizer (Guinea Pig)</u>	

Reproductive/Developmental Effects

Cyprodinil Technical:	No teratogenic potential was detected with cyprodinil in tests with rats and rabbits. No effects on reproductive performance of rats were detected.
Fludioxonil Technical:	Delayed development at doses causing maternal toxicity.

Chronic/Subchronic Toxicity Studies

Cyprodinil Technical:	Liver, kidneys and thyroid effects at high doses.
Fludioxonil Technical:	Liver and kidney toxicity high dose levels.

Carcinogenicity

Cyprodinil Technical:	Not carcinogenic in studies with rats and mice. Designed as class E "not likely" for human carcinogenicity (1998 USEPA "Pesticide Fact Sheet").
Fludioxonil Technical:	Fludioxonil was not oncogenic in mice. Results of a long-term feeding study with fludioxonil in rats showed a marginally increased incidence of liver tumours in female rats at the maximum tolerated dose (3,000 ppm). This was within historical control range (1 to 10%).

Other Toxicity Information:

None.

Toxicity of Other Components

The acute toxicity test results reported in Section 11, above, for the finished product take into account any acute hazards related to the "other components" in the formulation.

Diatomaceous Earth

The carrier in this product is naturally occurring diatomaceous earth. Natural diatomaceous earth contains a small percentage of naturally occurring crystalline silica, which is considered a probable human carcinogen. Chronic inhalation exposure to crystalline silica is known to cause silicosis and pulmonary fibrosis in humans. The amount of crystalline silica in this product is minimal and the potential for overexposure in manufacturing operations is low.

Sodium Sulphate

Exposure may cause irritation of the nose, throat and lungs. Repeated or prolonged contact to the skin results in dermatitis. May cause mild irritation to the eyes.

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

Target Organs

Active Ingredient

Cyprodinil Technical:	Liver, kidney, thyroid
Fludioxonil Technical:	Liver, kidney.

Inert Ingredients

Diatomaceous Earth	Respiratory tract.
Sodium Sulphate	Respiratory tract, skin, eye

SECTION – 12: ECOLOGICAL INFORMATION

Summary of Effects

The active ingredient, Cyprodinil, is practically nontoxic to mammals, birds and insects (bees), but is moderately toxic to fish and highly toxic to aquatic invertebrates (water flea).

The active ingredient, fludioxonil, is moderately to very highly toxic to fish (rainbow trout, bluegill sunfish) and aquatic invertebrates (water flea), but is practically non-toxic to insects (bees) and birds.

Eco-Acute Toxicity

Cyprodinil Technical:

Algae (Blue green) 120-hour EC ₅₀	2.25 ppm
Bees 48-hour LC ₅₀ /EC ₅₀	> 784 µg/bee
Invertebrates (Water Flea) LC ₅₀ /EC ₅₀	0.032 ppm
Fish (Trout) 96-hour LC ₅₀ /EC ₅₀	0.23 ppm
Fish (Bluegill) 96-hour LC ₅₀ /EC ₅₀	0.74 ppm
Bobwhite Quail Oral LD ₅₀	>2,000 mg/kg bw
Mallard Duck Oral LD ₅₀	> 2,000 mg/kg bw
Birds (5-day dietary - Bobwhite Quail) LC ₅₀ /EC ₅₀	> 5,200 ppm
Birds (5-day dietary - Mallard Duck) LC ₅₀ /EC ₅₀	> 5,200 ppm

Fludioxonil Technical:

Bees LC ₅₀ /EC ₅₀	> 25 µg/bee
Invertebrates (<i>Daphnia magna</i>) 48-hour LC ₅₀ /EC ₅₀	0.90 mg/L
Fish (Rainbow Trout) 96-hour LC ₅₀ /EC ₅₀	0.23 mg/L
Fish (Bluegill) 96-hour LC ₅₀ /EC ₅₀	0.74 mg/L
Bobwhite Quail LD ₅₀	> 2,000 mg/kg
Mallard Duck LD ₅₀	> 2,000 mg/kg
Birds (8-day dietary - Bobwhite Quail) LC ₅₀ /EC ₅₀	> 5,200 ppm
Birds (8-day dietary - Mallard Duck) LC ₅₀ /EC ₅₀	> 5,200 ppm

Eco-Chronic Toxicity

Cyprodinil Technical:

Invertebrates: <i>Daphnia</i> (Water Flea) 21-Day reproduction EC50	0.025 ppm
Fathead minnow 28 Day Early Life Stage NOEC	0.039 ppm
Bobwhite Quail Reproduction LOEL	600 ppm
Mallard Duck Reproduction LOEL	600 ppm

Fludioxonil Technical:

Fish (Fathead minnow) Early Life Stage MATC	0.028 ppm
Invertebrate (<i>Daphnia magna</i>) Life Cycle NOEC	0.019 ppm
Mallard Reproduction NOEC	700 ppm
Bobwhite Reproduction NOEC	300 ppm

Environmental Fate

The active ingredient, cyprodinil has a low bioaccumulation potential, low mobility in soil but is moderately persistent to persistent in soil or water. The Dissipation half-life in soil is 31 - 80 days and in water it is 16.3 days. The main route of degradation is by microbial degradation and formation of bound residues.

The active ingredient, fludioxonil, has a low bioaccumulation potential, low mobility in soil, but is slightly to moderately persistence in soil or sediment. The dissipation half-life of fludioxonil in soil is from 7-52 days under field test conditions. The dissipation half-life of fludioxonil in water is <10 days. The main route of degradation after foliar application is by photochemical degradation in sunlight. Microbial degradation and formation of bound residues are important pathways in the absence of sunlight. Degradation in soil at high concentrations is slowed by low solubility in water.

SECTION – 13: DISPOSAL CONSIDERATIONS

Waste disposal information: Do not reuse empty containers unless they are specifically designed to be refillable. Empty container retains product residue. Triple rinse, or equivalent, empty container, return rinse water to dilution mixture, and dispose of dilution mixture as a hazardous waste if it cannot be disposed of by use according to label instructions. 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.: 29648

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.

Prepared by: Syngenta Crop Protection Canada, Inc.
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