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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 & Biological Assessment
Syngenta Canada Inc.

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

SECTION – 1: PRODUCT IDENTIFICATION

Product Identifier: INSTRATA® FUNGICIDE Formulation No.: A14036B
Registration Number: 28861 (Pest Control Products Act)
Chemical Classes: A blend of chlorinated benzonitrile, substituted benzodioxalcarbonitrile and triazole derivative fungicides.

Active Ingredient (%): Chlorothalonil (29.9 %) CAS No.: 1897-45-6
Chemical Name : Tetrachloroisophthalonitrile.
Chemical Class: Chlorinated Benzonitrile Fungicide

Active Ingredient (%): Fludioxonil (1.2 %) 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

Active Ingredient (%): Propiconazole (4.7 %) CAS No.: 60207-90-1
Chemical Name: 1-[[2-(2,4-dichlorophenyl)-4-propyl-1,3-dioxolan-2-yl]methyl]-1H-1,2,4-triazole.
Chemical Class: Triazole Derivative Fungicide

Product Use: INSTRATA is a fungicide mixture for control of fungal diseases on golf course tees, greens and fairways. 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†
Propylene Glycol CAS No. 57-55-6	Not Established	Not Established	10 ppm TWA ****	No	Yes
Chlorothalonil (29.9 %)	Not Established	Not Established	0.1 mg/m ³ TWA (possible skin and respiratory sensitizer) ***	IARC Group 2B	Not Established
Propiconazole (4.7 %)	Not Established	Not Established	8 mg/m ³ TWA***	No	Not Established
Fludioxonil (1.2 %)	Not Established	Not Established	10 mg/m ³ TWA***	No	Not Established

*** 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.
Syngenta Hazard Category: C, S.

SECTION – 3: HAZARDS IDENTIFICATION

Symptoms of Acute Exposure

Harmful if swallowed or inhaled. Causes eye and skin. May cause an allergic skin reaction.

Hazardous Decomposition Products

Can decompose at high temperatures and form toxic gases.

Physical Properties

Appearance: Grey Liquid.

Odour: Aromatic.

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.

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 15 - 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 running water for a minimum of 20 minutes. Obtain medical attention if irritation occurs.
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. Have person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person. Do not induce vomiting unless directed by a physician or a poison control center. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer water.

NOTES TO PHYSICIAN:

There is no specific antidote if this product is ingested. Treat symptomatically.

Persons suffering with temporary allergic skin reactions may respond to treatment with oral antihistamines and topical or oral steroids.

MEDICAL CONDITIONS KNOWN TO BE AGGRAVATED:

None known.

SECTION – 5: FIRE FIGHTING MEASURES

Flash point and method: > 100 °C.

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

Auto-ignition temperature: > 650 °C.

Flammability: Not flammable

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: Product is not flammable. 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: 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. 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. Pump or scoop large amounts of liquid into a disposable container. Absorb remaining liquid or smaller spills with clay, sand or vermiculite. Scoop or sweep up material and place into a 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. Avoid breathing vapours or spray mist. Wear full protective clothing and equipment (see Section 8). 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 and prevent product from freezing. Keep separate from other products to prevent cross contamination. Rotate stock. Clean up spilled material immediately.

National Fire Code classification: Not regulated.

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 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 vapor 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: Grey Liquid.

Formulation Type: Flowable solution.

Odour: Aromatic.

pH: 5.5 @ 25 °C.

Vapour pressure and reference temperature: 5.7 x 10⁻⁷ mmHg @ 25 °C (Chlorothalonil Technical)
4.2 x 10⁻⁷ mmHg @ 25°C (Propiconazole Technical)
2.9 x 10⁻⁹ mmHg @ 25 °C (Fludioxonil Technical)

Vapour density: Not available.

Boiling point: Not available.

Melting point: Not available.

Freezing point: Not available.

Specific gravity or density: 1.21 g/cm³.

Evaporation Rate: Not available.

Water/oil partition coefficient: Not available.

Odour threshold: Not available.

Viscosity: 450 – 750 cps (or mPas) @ 20°C.

Solubility in Water: 0.81 mg/L @ 25 °C (Chlorothalonil Technical)
100 mg/L @ 20 °C (Propiconazole Technical)
1.8 mg/L @ 25 °C (Fludioxonil Technical)

SECTION – 10: STABILITY AND REACTIVITY

Chemical stability: Stable under normal use and storage conditions.

Conditions to avoid: Excessive heat or cold.

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>Slightly Acutely Toxic</u>	
	Oral (LD50 Female Rat):	> 1750 and < 5,000 mg/kg body weight
Dermal:	<u>Low Acute Toxicity</u>	
	Dermal (LD50 Rat):	> 5,000 mg/kg body weight

Inhalation:	<u>Slightly Acutely Toxic</u> Inhalation (LC50 Male Rat): 0.52 – 2.01 mg/L air - 4 hours
Eye Contact:	<u>Moderately Irritating (Rabbit)</u>
Skin Contact:	<u>Mildly Irritating (Rabbit)</u>
Skin Sensitization:	<u>Dermal Sensitizer (Guinea Pig)</u>

Reproductive/Developmental Effects

Chlorothalonil Technical:	No evidence of adverse developmental effects in rabbit and rat studies.
Fludioxonil Technical:	Delayed development at doses causing maternal toxicity.
Propiconazole Technical:	None observed.

Chronic/Subchronic Toxicity Studies

Chlorothalonil Technical:	In dogs, 1 years administration caused a significant decrease in body weight gain and increases in absolute liver and kidney weights. Neurotoxicity: No evidence in regulatory studies.
Fludioxonil Technical:	Liver and kidneys toxicity high dose levels. Changes in urine colour (predominantly blue) occurred following repeated dosing in all species tested.
Propiconazole Technical:	None observed.

Carcinogenicity

Chlorothalonil Technical:	No evidence of carcinogenicity in dogs after administration for up to one year. Treatment related increases in the incidence of renal tubular adenoma and carcinoma were observed in rats and male mice. Squamous cell adenomas and carcinomas were also observed in the forestomach of both species. However, the forestomach tumors seen in rodent studies are not relevant to human health as humans do not possess an anatomical equivalent of the rodent forestomach. The relevance of renal tumors to human health is unclear. However, metabolism data suggest that the dog, a species that is resistant to chlorothalonil-induced renal injury, may be more representative of humans than the rat. Subsequently, IARC identifies chlorothalonil as a 2B carcinogen (possibly carcinogenic to humans).
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%).
Propiconazole Technical:	Long-term exposure of mice to high dose levels of propiconazole produced an increase in liver tumors in male mice. Propiconazole is not considered to be carcinogenic.

Other Toxicity Information:

Studies on rats and mice have suggested that technical chlorothalonil (97%), when fed at high levels in the diet, may have oncogenic potential to these laboratory animals. However, neither chlorothalonil nor its metabolites interact with DNA and thus are not mutagenic. Tumor formation has been related to a non-genotoxic mechanism of action for which threshold levels have been established in rats and mice. Comprehensive dietary and worker exposure studies have shown exposure levels for humans to be well below these threshold levels. In addition, surveillance of chlorothalonil plant workers for over twenty years has not demonstrated any increase in oncogenic potential to humans. In addition, exposure of the skin to chlorothalonil may result in weak contact dermatitis.

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.

Propylene Glycol

Reported to cause central nervous system depression (anesthesia, dizziness, confusion), headache and nausea. Also, eye irritation may occur with lacrimation but no residual discomfort or injury. Prolonged

contact to skin may cause mild to moderate irritation and possible allergic reactions. Chronic dietary exposure caused kidney and liver injury in experimental animals.

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

Target Organs

Active Ingredients

Chlorothalonil Technical:	Lung, eye, kidney.
Fludioxonil Technical:	Liver, kidney.
Propiconazole Technical:	Liver.

Inert Ingredients

Propylene Glycol	CNS, skin, eye, kidney, liver.
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SECTION – 12: ECOLOGICAL INFORMATION

Summary of Effects

Chlorothalonil, is practically nontoxic to plants, algae, mammals, birds and insects, but is highly toxic to fish and aquatic invertebrates (water flea). 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 and birds. The third active ingredient, propiconazole, is moderately toxic to aquatic organisms, but practically non-toxic to birds.

Eco-Acute Toxicity

Chlorothalonil Technical:

Green Algae 5-day EC ₅₀	190 ppb
Invertebrates (<i>Daphnia magna</i>) 48-hour EC ₅₀	70 ppb
Fish (Rainbow Trout) 96-hour LC ₅₀	47 ppb
Birds (Mallard Duck) 14-Day LD ₅₀	> 4,640 mg/kg

Fludioxonil Technical:

Green Algae 5-day EC ₅₀	0.087 ppm
Invertebrates (<i>Daphnia magna</i>) 48-hour EC ₅₀	0.9 ppm
Fish (Rainbow Trout) 96-hour LC ₅₀	0.47 ppm
Birds (Bobwhite Quail) 14-Day LD ₅₀	> 2,000 mg/kg

Propiconazole Technical:

Green Algae 5-Day EC ₅₀	1.6 ppm
Invertebrates (<i>Daphnia magna</i>) 48-hour LC ₅₀ /EC ₅₀	4.8 ppm
Fish (Rainbow Trout) 96-hour LC ₅₀ /EC ₅₀	0.85 ppm
Bird (Mallard Duck) 14-Day LC ₅₀	2,510 mg/kg

Environmental Fate

The active ingredient, chlorothalonil has a low bioaccumulation potential, and low mobility in soil but is not persistent in soil or water. The dissipation half-life in soil is 10-60 days and in water it is <8 days. The main route of degradation is by microbial degradation and formation of bound residues. Fludioxonil has a low bioaccumulation potential, low mobility in soil, and low persistence in soil and water. The dissipation half-life in soil and water is <10 days. The main route of degradation is by microbial degradation and formation of bound residues. Propiconazole has a low bioaccumulation potential, and low mobility in soil but is not persistent in soil or water. The dissipation half-life in soil is 70 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.: 28861

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 Canada Inc.
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