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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 Assessment
Syngenta Canada Inc.

**For further information contact:
1-87-SYNGENTA (1-877-964-3682)**

SECTION – 1: PRODUCT IDENTIFICATION

Product Identifier: MAXIM[®] MZ PSP (POTATO SEED PROTECTANT) Formulation No.: A13677B & C

Registration Number: 27965 (Pest Control Products Act)

Chemical Classes: A mixture of substituted benzodioxalcarbonitrile and dithiocarbamate fungicides.

Active Ingredient (%): Fludioxonil (0.5%) 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 (%): Mancozeb (5.7%) CAS No.: 8018-01-7

Chemical Name: Manganese ethylenebis(dithiocarbamate) (polymeric) complex with zinc salt

Chemical Class: Dithiocarbamate Fungicide

Product Use: A dry powder for the treatment of potato seed pieces for the control of Black Scurf (*Rhizoctonia solani*), Silver Scurf (*Helminthosporium solani*), and Fusarium Dry Rot (*Fusarium* spp.). 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†
Talc (CAS No. 14807-96-6)	20 mppcf TWA (containing < 1% quartz)	2 mg/ m ³ TWA (respirable; < 1% crystalline silica)	2 mg/m ³ TWA (respirable) **	IARC Group 3	Not Established
Crystalline Silica, Quartz (CAS No. 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 Group 1 ACGIH A2	Yes
Solid Diluent (Limestone, Calcium Carbonate)	15 mg/m ³ (total dust) TWA; 5 mg/m ³ (respirable dust) TWA	10 mg/m ³ TWA (total dust)	Not Established	No	Not Established
Carrier 1 (B)	5 mg/m ³ TWA (respirable dust)	1 mg/m ³ (total dust)	Not Established	No	Not Established
Carrier 2 (C)	5 mg/m ³ TWA (respirable dust)	10 mg/m ³ TWA (total dust)	Not Established	No	Not Established
Fludioxonil (0.5 %)	Not Established	Not Established	10 mg/m ³ TWA***	No	Not Established

Mancozeb (5.7%) Not Established Not Established 1 mg/m³ TWA* No Not Established

- * Recommended by manufacturer
- ** 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

Causes mild eye irritation. May cause an allergic skin reaction. Exposure to dust may cause respiratory irritation.

Hazardous Decomposition Products

Can decompose at high temperatures forming toxic gases.

Physical Properties

Appearance: Grayish tan solid.
Odour: Odourless.

Unusual Fire, Explosion and Reactivity Hazards

DO NOT expose mancozeb containing material to high temperatures or small quantities of water as spontaneous combustion may occur at high temperatures or when exposed to water (due to possible generation of carbon disulfide which is a flammable gas). Exposure to excessive heat or ignition sources presents a definite ignition hazard. Fire can occur in closely packed, unventilated piles of bags. Do not allow containers to be exposed to rain or dampness. Check containers for warmth and remove warm containers to open areas for disposal. Mancozeb is combustible. Do not expose this material to flames or sparks. Minimize dusting as mancozeb dust can form explosive clouds. This product is a combustible powder and like all combustible powders can ignite, burn and form explosive mixtures with air if not handled correctly. Mixtures of powder in air with flammable solvent vapours should be avoided. 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 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.

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 flammable.

Hazardous combustion products: DO NOT expose mancozeb containing material to high temperatures or small quantities of water as spontaneous combustion may occur at high temperatures or when exposed to water (due to possible generation of carbon disulfide which is a flammable gas). Exposure to excessive heat or ignition sources presents a definite ignition hazard. Fire can occur in closely packed, unventilated piles of bags. Do not allow containers to be exposed to rain or dampness. Check containers for warmth and remove warm containers to open areas for disposal. Mancozeb is combustible. Do not expose this material to flames or sparks. Minimize dusting as mancozeb dust can form explosive clouds. This product is a combustible powder and like all combustible powders can ignite, burn and form explosive mixtures with air if not handled correctly. Mixtures of powder in air with flammable solvent vapours should be avoided. During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

Conditions under which flammability could occur: See “Hazardous combustion products”, above.

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. Wear suitable protective 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 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 disposition. Spillages or uncontrolled discharges into watercourses must be alerted to the appropriate regulatory body.

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. 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 30 °C. Keep separate from other products to prevent cross contamination. Rotate stock. Clean up spilled material immediately. Do not wet or heat this product during storage as decomposition and the threat of fire can result. Check for hot containers and immediately remove any identified to open areas for cooling and/or disposal. When handling, avoid material transfers that could expose the product to frictional heating.

National Fire Code classification: Not applicable.

SECTION – 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

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

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

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 (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, R or HE class filter and an organic vapour cartridge may be used under certain circumstances where airborne concentrations are expected to exceed exposure limits (e.g. emergency spills).

SECTION – 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Grayish tan solid.

Formulation Type: Solid.

Odour: Odourless.

pH: 6.2 (1% aqueous solution @ 25°C).

Vapour pressure and reference temperature: Fludioxonil Technical: 2.9×10^{-9} mmHg @ 25°C
Mancozeb Technical: Negligible.

Vapour density: Not available.

Boiling point: Not applicable.

Melting point: Not available.

Freezing point: Not applicable.

Specific gravity or density: 0.40 - 0.48 g/cm³.

Evaporation Rate: Not available.

Water/oil partition coefficient (log Kow): 4.1 (Fludioxonil Technical).
0.3 (Mancozeb Technical)

Odour threshold: Not available.

Viscosity: Not applicable.

Solubility in Water: Fludioxonil Technical: 1.8 mg/L @ 25 °C
Mancozeb Technical: 6.2 mg/L @ 25 °C

SECTION – 10: STABILITY AND REACTIVITY

Chemical stability: Stable under normal use and storage conditions.

Conditions to avoid: Temperatures above 30 °C. DO NOT allow product to become wet or overheated during storage. See “Hazardous combustion products”, above.

Incompatibility with other materials: Product is incompatible with acids, halogens and metals.
Hazardous decomposition products: Can decompose at high temperatures forming toxic gases.
Hazardous polymerization: Will not occur.

SECTION – 11: TOXICOLOGICAL INFORMATION

Acute toxicity/Irritation Studies (Finished Product):

Ingestion:	<u>Low Acute Toxicity</u> Oral (LD50 Rat):	> 5,000 mg/kg body weight
Dermal:	<u>Low Acute Toxicity</u> Dermal (LD50 Rat):	> 5,000 mg/kg body weight
Inhalation:	<u>Low Acute Toxicity</u> Inhalation (LC50 Rat):	> 2.11 – 2.64 mg/L air - 4 hours
Eye Contact:	<u>Mildly Irritating (Rabbit)</u>	
Skin Contact:	<u>Non-Irritating (Rabbit)</u>	
Skin Sensitization:	Not a <u>Sensitizer (Guinea Pig)</u>	

Reproductive/Developmental Effects

Fludioxonil Technical:	Delayed development at doses causing maternal toxicity.
Mancozeb Technical:	Suspected of damaging the unborn child.

Chronic/Subchronic Toxicity Studies

Fludioxonil Technical:	Liver and kidneys toxicity high dose levels.
Mancozeb Technical:	Thyroid, liver and nervous system effects seen in laboratory animals at high, repeat doses. Hind leg paralysis and retinopathy observed at 750 ppm (rat and dog studies).

Carcinogenicity

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%).
Mancozeb Technical:	Did not show carcinogenic or mutagenic effects in animal experiments.

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.

Carrier 1 (“B” Formula)

May produce allergic reaction in sensitive individuals. Exposure to dust may cause respiratory irritation.

Carrier 2 (“C” Formula)

Overexposure results in congestion and irritation of the throat, nasal passages and upper respiratory system. Also may cause temporary irritation and inflammation to the eyes.

Limestone (Calcium Carbonate)

Excessive contact with powder can cause drying of mucous membranes of nose, eyes, and throat due to absorption of moisture and oils. Continued long-term contact may affect respiratory function.

Solid Diluent

OSHA requires the hazards of the components of mixtures be shown on a Material Safety Data Sheet. A component of this diluent is naturally occurring crystalline silica (< 5%), which is considered a human carcinogen. Chronic inhalation exposure to crystalline silica is known to cause silicosis and pulmonary fibrosis in humans. Experimental animals exposed to crystalline silica developed respiratory tract cancers. This product can release nuisance dust in handling or during use. Eye, skin, nose, throat and upper respiratory irritation can occur with dust exposure.

Talc

Prolonged inhalation of talc may cause scarring of the lungs, shortness of breath and respiratory assisted heart failure. Contact with the skin can cause dryness.

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

Target Organs

Active Ingredient

Fludioxonil Technical:

Liver, kidney.

Mancozeb Technical:

Thyroid, pituitary gland, liver, blood, eye, skin, respiratory system, CNS.

Inert Ingredients

Carrier

Eyes and respiratory tract.

Solid Diluent

Respiratory tract, eyes and skin.

Talc

Respiratory system.

Limestone (Calcium Carbonate)

Respiratory tract

SECTION – 12: ECOLOGICAL INFORMATION

Summary of Effects

MAXIM MZ PSP is a fungicide that is mixed with water and applied as a dry powder on potato seed pieces for the control of various fungal diseases. The active ingredients, fludioxonil and mancozeb, are moderately to very highly toxic to fish and aquatic invertebrates (water flea), but are practically non-toxic to insects (bees) and birds.

Eco-Acute Toxicity

Fludioxonil Technical:

Green Algae 5-day EC ₅₀	0.83 ppm
Bees LC ₅₀ /EC ₅₀ (Contact)	>100 µg/bee
Invertebrates (Water Flea) LC ₅₀ /EC ₅₀	0.90 ppm
Fish (Trout) 96-hr LC ₅₀ /EC ₅₀	0.23 ppm
Fish (Bluegill) 96-hr LC ₅₀ /EC ₅₀	0.74 ppm
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

Mancozeb Technical:

Bees LC ₅₀ /EC ₅₀	193 µg/bee
Invertebrates (<i>Daphnia magna</i>) 48-hour LC ₅₀ /EC ₅₀	1.0 mg/L
Fish (Rainbow Trout) 96-hour LC ₅₀ /EC ₅₀	1.9 mg/L
Fish (Bluegill) 96-hour LC ₅₀ /EC ₅₀	1.63 mg/L
Bobwhite Quail LD ₅₀	Not Available
Mallard Duck LD ₅₀	Not Available
Birds (8-day dietary - Bobwhite Quail) LC ₅₀ /EC ₅₀	> 6,400 ppm
Birds (8-day dietary - Mallard Duck) LC ₅₀ /EC ₅₀	> 6,400 ppm

Eco-Chronic Toxicity

Fludioxonil Technical:

Invertebrates (Water Flea) 21-day NOEC

19 ppb

Fish (Trout) 21-day NOEC

19 ppb

Mancozeb Technical:

Not available.

Environmental Fate

The active ingredient fludioxonil has a low bioaccumulation potential, low mobility in soil, and is not persistent in the environment. The main routes of degradation are by biological and photolytic degradation, and formation of bound residues.

The active ingredient mancozeb has a low bioaccumulation potential, low mobility in soil, and is not persistent in the environment. The main routes of dissipation are by biological, chemical and photolytic degradation.

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.: 27965

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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