Nichino America, Inc. Product Name
MonCoat MZ™

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	MonCoat MZ (Flutolanil/Mancozeb)
Chemical Name:	N-[3-(1-methylethoxy)phenyl]-2-(trifluoromethyl) benzamide; Mancozeb (active ingredients)
Chemical Family:	Benzamide/Manganese-Zn
Chemical Formula:	Mixture (active ingredient: $C_{17}H_{16}F_3NO_2$; Manganese/Zn)
EPA Registry Number:	71711-8
MSDS Identification Code/Number:	002
Synonyms:	PCC 511
Canadian Reg. No.:	None

Manufacturer

Main Headquarter:

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Non-emergency information:
Phone: 81-3-3278-0461
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Phone: 81-3-3281-1887

US Connection:

Nichino America Inc.,
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Wilmington, Delaware 19808, USA
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Emergency and Health and Safety Inquiries: 1-800-348-5832 (24-hours).
In case of fire or spills, information may be obtained by calling (800) 424-9300.
In case of international shipments, call (703) 527-3887.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name	Exposure Limits	Concentration % by Weight
Flutolanil CAS No.: 66332-96-5	OSHA-PEL: - ACGIH-TLV: -	1.5
Mancozeb CAS No.: 8018-01-7 ACGIH-TLV: -	TWA = 1.0 mg/m3 OSHA-PEL: -	6
Inert Ingredients CAS No.: Trade Secret Total dust = 10 mg/m3 Respirable dust = 5 mg/m3	OSHA-PEL & ACGIH-TLV (as nuisance dust):	92.5
Crystalline Silica (Quartz) CAS No.: 14808-60-7 crystalline silica)	OSHA-PEL & ACGIH-TLV: 0.1 mg/m3 (respirable	< 1
Ethylene thiourea (2-imidazolidinethione) CAS No.: 96-45-7	OSHA-PEL: - ACGIH-TLV: -	
Hydrous Magnesium silicate CAS No.: 14807-96-6	OSHA-PEL & ACGIH-TLV: 2 mg/m3 (respirable dust)	< 50

Inert Ingredients (92.5%) for only the three regulated inert ingredients are listed above. Please refer to Section 15 complete regulatory listing of component ingredients. OSHA-PEL: OSHA Final Limits were used above.

3. HAZARDS IDENTIFICATION

**************************EMERGENCY OVERVIEW*************************

DO NOT ALLOW THE PRODUCT TO BECOME WET OR OVERHEATED IN STORAGE. MonCoat MZ contains Mancozeb which decomposes under conditions of moisture/heat, resulting in impaired biological activity. The product is labeled as "Dangerous When Wet" (under Tranportation Regulations). The product is a moderate eye irritant. It may contain a very small amount of ethylenethiourea (a metabolite of Mancozeb) which is considered by NTP as a probable human carcinogen. The Product is a light greyish-yellow powder with no distinct odor.

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Potential Health Effects:

Primary route(s) of entry: Dust inhalation, skin contact.

Eyes: A moderate eye irritant.

Skin: May be a slight skin irritant. May have a weak potential for skin sensitization in certain individuals (Mancozeb, positive in Mazimization Test in guinea pigs, but negative in Buehler's contact-test.)

Ingestion: No specific health effects are known for ingestion of a minute amount incidental to routine handling and use. (see Signs and Symptoms below)

Inhalation: Excessive dust inhalation can cause irritation of nose, throat, and the upper respiratory track.

Chronic (cancer information): Flutolanil technical is not listed as carcinogenic by NTP, IARC, or OSHA.

Ethylenethiourea (ETU), a Mancozeb metabolite, is considered by NTP as a probable human carcinogen; also listed in the NTP Testing Program Substances. Under conditions of high experimental doses, ETU demonstrated toxic effects on thyroid, resulting in thyroid tumors in animal studies. In addition, ETU also affects other endocrine organs, liver and the blood system.

One inert ingredient contains a small amount of crystalline silica, which is a naturally occurring component of sand, clay and inorganic soil. Chronic exposure to of respirable crystalline silica is known to cause silicosis (formation of fibrous tissue in the lung) if inhaled. IARC has listed the crystalline silica as a probable human carcinogen (class 2A), based on human inhalation exposures under excessive and chronic conditions (e.g., long-term clay or mineral mining working conditions). However, MonCoat MZ contains only a small amount of respirable crystalline silica (<1.0%) and such long-term risk is considered unlikely. Under the recommended conditions of normal handling and use, excessive and chronic inhalation exposure by the users is unlikely.

Signs and symptoms: Excessive dust inhalation may irritate the respiratory tract. Effects of overexposure are probably non-specific and slight.

Medical conditions aggravated by overexposure:

Excessive dust inhalation may aggravate pre-existing conditions of the upper respiratory system.

NOTE: Please refer to Section 11 for detailed toxicological information on Mancozeb and its metabolites.

4. FIRST AID MEASURES

Eye Contact: Flush eyes with plenty of water. Get medical attention.

Skin Contact: Wash with plenty of soap and water.

Ingestion: Drink one or two glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything to an unconscious person. Get medical attention.

Inhalation: Remove person to fresh air.

Note to Physician: Supportive care. Treatment based on judgment of the physician.

5. FIRE-FIGHTING MEASURES

Flash Point: 137.8°C Stabilized Mn/Zn complex

Fire or Explosion Hazards: Dispersion of fine dust in the air can form an explosive mixture. Will burn to give off toxic oxides of carbon and nitrogen.

Extinguishing Media: Water, foam, carbon dioxide, or dry powder.

Fire Fighting Instructions: Wear positive pressure self-contained breathing apparatus. Spray containers with water to keep cool.

6. ACCIDENTAL RELEASE MEASURES

General and Disposal: Use proper protective equipment to minimize exposure (see Section 8). Take all necessary action to prevent and to remedy the adverse effect of the spill. Ensure the disposal is in compliance with federal requirements and state or local regulations.

Land Spill or Leak: Sweep up carefully, avoiding the formulation of a dust cloud. Place in suitable container and seal for disposal. Area can be washed with water to remove last traces of material, but keep out of watercourses or sewers. Inform authorities immediately if contamination occurs.

7. HANDLING AND STORAGE

Handling Precautions: Avoid contact with skin, eyes, or clothing. Use proper protective equipment for routine handling and use (See Section 8). Avoid breathing dust. In cases of contact, immediately flush eyes or the skin with plenty of water. Wash hands and exposed skin before eating, drinking, or smoking and after handling. Wash all contaminated clothing thoroughly before reuse.

Storage Precautions: Store in a cool, dry area and keep container tightly closed. DO NOT allow this product to become wet or overheated in storage; the product is stable in normal storage conditions but decomposes by moisture at high temperatures. The product is labeled, for transport purposes, as "Dangerous When Wet". Decomposed product produces a foul odor. Do not store near or contaminate food or feed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Control airborne concentrations below the exposure guideline (see Section 2 for any applicable OSHA/ACGIH exposure limits). Use with adequate ventilation. Local exhaust ventilation is highly recommended, especially when used in a confined area.

Eye/Face Protection: Safety glasses; chemical workers goggles

Skin Protection: Use only chemical resistant gloves (e.g. PVC). Replace damaged gloves at once. Rinse/remove gloves immediately after use and wash hands thoroughly.

Respiratory Protection: Ensure good ventilation. Use a suitable air-purifying respirator equipped with pesticide cartridge (organic vapor cartridge and pesticide prefilter).

Other/General Protection: Use chemical resistant apron or other impervious clothing to avoid prolonged or repeated skin contact. Work clothing should be removed at the end of the shift and laundered clean thoroughly.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Light grayish-yellow powder

Odor: No distinct odor

Basic Physical Properties:

Physical State:	Solid
Boiling Point:	Not applicable
Melting point*:	219-221°F 104-105°C
Vapor Pressure:	1.33 x 10-5 mm Hg (20°C or 68°F)
Vapor Density (Air=1):	Not volatile
Packing Density:	30 lb/ft3 (est.)
Solubility (H2O)*:	9.6 mg/L (9.6 ppm) (20°C or 68°F)

** No data for the formulated product; these values are for the a.i.*

10. STABILITY AND REACTIVITY

Stability: Stable under normal storage conditions (see below)

Conditions to Avoid (Stability): Extreme heat or moisture. This product contains Mancozeb (6%) which is decomposed under high temperatures by moisture, releasing hazardous metabolites (see below). Mancozeb can also be decomposed by acid

Hazardous Decomposition Products: Ethylenethiourea (ETU) and Ethylenebisdithiocarbamic acid, salts and esters.

Hazardous Polymerization: None

11. TOXICOLOGICAL INFORMATION

Acute Studies:

No data available for the formulated product MonCoat MZ. The product contains low concentrations of two active ingredients (1.5%; 6%) and no toxic effects are anticipated under the recommended conditions of normal handling and use. The acute LD 50 (rats) for Mancozeb is: > 8,000 mg/kg.

Eye Effects:

A moderate eye irritant

Skin Effects:

A slight skin irritant. Repeated contact may cause skin sensitization reactions in certain individuals.

The studies below were carried out with Flutolanil technical (98%) and a Mancozeb formulation which contains 85% Mancozeb:

Subchronic (Target Organ Effects):

MonCoat MZ contains low concentrations (6% and 1.5%, respectively) of Mancozeb and Flutolanil technical. Results from 90-day animal studies with the technicals suggest no target organ effects under the conditions of normal handling and use.

Chronic (Cancer Information):

Flutolanil technical:	In 2-year feeding studies with flutolanil in rats, no organotoxic effects were observed at dose levels up to 200 ppm. At very high experimental dose levels (2,000-10,000 ppm), slight anemia, minor liver damage, and some nephrosis were observed. However, flutolanil had no significant effect on mortality and was not carcinogenic at any of the doses tested. Similar results were seen in dogs administered up to 1250 mg/kg/day.
Mancozeb:	Two-year feeding study of mancozeb indicated thyroid tumors in rats at a dietary concentration of 750 ppm. No evidence of carcinogenicity was observed in long-term studies with mice.
Ethylenethiourea (ETU):	Two-year feeding study in rats with ETU indicated thyroid tumors at dietary concentrations of 83 ppm and higher. Two-year feeding study in mice indicated thyroid, pituitary and liver tumors at dietary concentrations of 330 ppm or higher. The carcinogenic effects observed for ETU and Mancozeb are considered to be secondary to inhibition of thyroid synthesis and disruption of hormonal balance.

Carcinogenicity: NTP: Yes IARC: No OSHA: No

Teratogenicity (Birth Defects):

Flutolanil technical:	The technical demonstrated no teratogenic effects in rabbits at oral dose levels up to 1000 mg/kg/day.
Mancozeb:	Developmental toxicity studies with mancozeb indicated a maternal toxicity level of 80 mg/kg/day in rabbits. There was no evidence of developmental effects. The NOEL was 30 mg/kg/day. In rats, a developmental toxicity study indicated a maternal toxicity level of 128 mg/kg/day; developmental effects including malformations were

noted at 512 mg/kg/day. The NOEL was 32 mg/kg/day.

Ethylenethiourea (ETU): In developmental toxicity studies with ETU in rats and hamsters, malformations were produced at thyroid-inhibiting dose levels. In comparison, no malformations were produced in rabbits, mice, guinea pigs or cats. The overall NOEL is 5 mg/kg/day in the rat.

Reproductive Effects:

Flutolanil technical: The technical demonstrated no adverse effect on reproduction in a 3-generation rat reproduction study at dietary doses up to 10,000 ppm.

Mancozeb or ETU: No adverse effects on reproduction were seen in the 2-generation rat studies with Mancozeb or ETU.

Neurotoxicity:

Data not available.

Mutagenicity (Genetic Effects):

Flutolanil technical was not a mutagenic or genotoxic when tested in the Ames gene mutation assay, the mouse micronucleus test, or the chromosomal aberration assay.

Mancozeb was not known to be mutagenic or genotoxic when tested in the Ames and several other mutagenic assay systems. Mutagenicity assays with ETU also demonstrated negative results in 10 of the 13 systems tested; the results from the remaining three assays were inconclusinve or equivocal.

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12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

Environmental Hazard: The product may be toxic to fish. DO NOT contaminate water when disposing of equipment wash waters. DO NOT apply directly to water or wetlands.

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13. DISPOSAL CONSIDERATION

Proper Pesticide Disposal: Handling and disposal of pesticide wastes, including spills or rinsates, must be in accordance with federal requirements under the Resource Conservation and Recovery Act (RCRA). Also must ensure that the waste disposal is in compliance with state and local regulations, which may be more restrictive or otherwise different from the RCRA requirements.

Do not contaminate water, food, or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved disposal facility. Incineration at a federal/state/local approved site is recommended.

RCRA Information:

RCRA Hazardous Waste Ingredients: Ethylenethiourea = U 116
Flutolanil technical is not a listed chemical under RCRA.

14. TRANSPORT INFORMATION

Proper Shipping Name: Maneb preparations, stabilized against self-heating, 4.3, UN 2968, PG III, * .(* insert Net Weight for USA shipping)

Dot Shipping Label: Dangerous When Wet

Freight Classification: Agricultural Fungicide, Dry, N.O.I.

Additional information for Domestic (USA) Shipping:

Package marking: Maneb preparations, stabilized against self-heating, UN 2968

Domestic packaging: In accordance with 173.213 (HM-181).

International Air Packaging Instruction:

Y419, for limited quantities of Division 4.3 in PG III.

15. REGULATORY INFORMATION

U.S. Federal Regulatory Information:

TSCA: Flutolanil technical and Mancozeb are registered pesticides under US-FIFRA regulations and are therefore exempted from TSCA listing. All other inert ingredients are listed in the TSCA Inventory.

SARA Title III:

Section 302 (EHS) Ingredients: Not listed

Section 304 (CERCLA & EHS) Ingredients (RQ): The product may contain Ethylenethiourea (ETU), a metabolite from decomposed Mancozeb. The RQ (for ETU) is 10 1b. Based on the Manufacturer's information for Dithane M-45 (with 85% Mancozeb), the RQ for MonCoat MZ: >=70,000 1b.

Notifications and Information:

Reportable Quantity (pounds): 70833

Hazard Classes:

Acute Health Hazard:	Yes
Chronic Health Hazard:	Yes
Fire Hazard:	No
Sudden Release of Pressure Hazard:	No
Reactivity Hazard:	No

Section 313 (Supplier Notification): This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

CAS Number	Ingredient Name	% by Weight
8018-01-7	Mancozeb (Manganese-Zn)	6
96-45-7	Ethylenethiourea (2-imidazolidinethione)	unknown

This information must be included on all MSDSs that are copied and distributed for this material.

Regulated Ingredients:

Ingredient: Mancozeb (Manganese-Zn)
CAS Number: 8018-10-7
% by Weight: 6
Regulations: California Proposition 65
SARA Section 313 Toxic Chemical

Ingredient: Ethylenethiourea (2-imidazolidinethione)
CAS Number: 96-45-7
Regulations: Massachusetts Hazardous Substance
New Jersey Environmental Hazardous Substance
New Jersey Special Health Hazardous Substance
Listed On The National Toxicology Program (NTP)
California Proposition 65
RCRA Hazardous Waste
SARA Section 313 Toxic Chemical
WHMIS (Canada)

U.S. State Regulatory Information:

State Right-to-Know (RTK) Hazard Substance List:

Flutolanil is not a listed chemical under any State RTK-regulations. For all other ingredients, the RTK information for individual States in the USA is listed above.

Canadian Regulatory Information: (Canadian WHMIS Controlled-Product Regulations):

Flutolanil and Mancozeb are registered pesticides under US-FIFRA and are therefore exempted from WHMIS Controlled-Product Regulations. See above for other listings.

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16. OTHER INFORMATION

HMIS Hazard Rating:
Health: 2 Moderate
Fire: 1 Slight
Reactivity: 1 Slight
PPE (Min*): F*

NFPA Hazard Rating:
Health: 2 Moderate
Fire: 1 Slight
Reactivity: 1 Slight
Spec. Haz.: Yes

Special Hazards: Labeled as "Dangerous When Wet" (polymerized Manganese/Zinc).

MSDS Identification Code/Number: 002

Prepared By: Regulatory Affairs **Phone:** 302-636-9001

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MSDS Revision: Company name change, correct typographical errors.