	SAFETY DATA SHEET	Issue date: 17/09/2023
	MANCOZEB 80 WP Parsian Chem Co., PSJC	Edition No.: 1 Date of Edition: -

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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PRODUCT NAME : **Mancozeb 80% WP**
 CHEMICAL NAME : Mancozeb
 PRODUCT USE : Fungicide
 REGISTRATION DATE : 22-02-1970
 CREATION DATE : 17-09-2023
 REVISION DATE : NA

SECTION 2 - HAZARDS IDENTIFICATION SUMMARY

Toxicity class:

Fungicide of low toxicity order.

Eye contact:

Product dust, mist or vapor may cause mild to moderate irritation.

Skin contact:

Mild irritation. Skin sensitization reaction may occur in some individuals.

Ingestion:

Harmful. The target organs for Mancozeb are the thyroid gland and the liver.

Inhalation:

Inhalation of the dust may be irritating to the nose, throat, respiratory tract and lungs.

Delayed effects:

ETU, a trace contaminant and breakdown product of Mancozeb, primarily affects the thyroid and liver. It has also caused other endocrine and blood effects, tumors and birth defects in test animals.

Environmental Hazard:

Product is very toxic to fish and aquatic organisms.

Hazardous decomposition products:

Product can be decomposed at high temperatures forming toxic gases.



SECTION 3 - COMPOSITION, INFORMATION OF INGREDIENTS

Common name : Mancozeb
 Chemical name : manganese ethylenebis (dithiocarbamate) (polymeric) complex with zinc salt (IUPAC)
 CAS No. : 8018-01-7
 Chemical family : dithiocarbamate
 Chemical Formula : $[C_4H_6MnN_2S_4]XZn_Y$
 Molecular Weight : 271.2

Use : Contact fungicide with protective and curative action
 Mancozeb reacts and activates the sulfhydryl group of amino acids and enzymes of fungal cells.

Formulation : 800 g/kg

COMPONENT	CAS No.	PERCENTAGE	Classification according to Regulation (EC) No 1278/2008 (CLP)
Mancozeb Manganese ethylenebis(dithiocarbamate) (polymeric) complex with zinc salt	8018-01-7	78 - 83	Skin Sens. 1 – H317 Repr. 2 – H361d Aquatic acute 1 – H400
Sodium methylene Polymethylnaphthyl sulphonate	1322-93-6	<1	Acute Tox. 4 - H332 Acute Tox. 4 - H302 Eye Irrit. 2 - H319 STOT SE 3 - H335
Hexamethylene tetramine	100-97-0	<1	Flam. Sol. 2 - H228 Skin Sens. 1 H317 Resp. Sens.1 - H334

SECTION 4 - FIRST AID MEASURES

First Aid responders should use protective equipment in Section 8 if there is a potential for exposure to product.

IF SWALLOWED: Call a poison control center or doctor immediately for treatment advice. If the patient is conscious, If the patient is conscious, rinse out mouth thoroughly and have them sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

IF ON SKIN OR CLOTHING: Gently wipe off excess chemical. Wash affected skin areas gently and thoroughly with water and non-abrasive soap. Do not rub the skin. If irritation persists, seek medical advice. Persons who become sensitized may require specialized medical management with anti-inflammatory agents or cortisone-containing emulsions. Wash contaminated clothing before next use.

IF IN EYES: Hold eye open and immediately rinse slowly and gently with large quantity of drinking water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye for 15 more minutes. Call a poison control center or doctor for treatment advice.

IF INHALED: Move the victim to fresh air or remove source of contamination. Keep person warm and at rest. Provide artificial breathing if the breathing has stopped. Seek medical attention immediately. Have a product container or label with you when calling a poison control center or doctor, or going for treatment.

NOTE TO PHYSICIAN: No specific antidote, treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

National Fire Protection Rating (NFPA)

HEALTH	1
FLAMMABILITY	0
REACTIVITY	0
4=Severe 3=Serious 2=Moderate 1=Slight 0=Minimal	

FLASHPOINT: >200°F / >100°C

EXTINGUISHING MEDIA: Extinguish small fires with carbon dioxide, dry powder, or alcohol-resistant foam. Water spray can be used for cooling of unaffected stock. Do not use direct jet of water. Avoid water coming in contact with the

product. Contain water used for firefighting for later disposal. Avoid the accumulation of polluted run-off from the site.

FIRE AND EXPLOSION HAZARD: Spontaneous combustion may occur at high temperatures or when exposed to water. Exposure to excessive heat or ignition sources presents a definite ignition hazard. Fire can occur in closely packed, unventilated piles of bags. Exposure to moisture promotes decomposition which can cause spontaneous combustion.

HAZARDOUS COMBUSTION PRODUCTS: Can burn in fire, releasing irritating and toxic gases due to thermal decomposition or combustion. Combustion and/or fire generates products of hydrogen sulfide, carbon dioxide, carbon monoxide, nitrogen oxides, sulfur dioxide and carbon disulfide.

FIREFIGHTING: Remove spectators from surrounding area. Isolate the fire area and evacuate downwind. Use a recommended extinguishing agent for the type of surrounding fire. Fight fire from maximum distance and use unmanned hose holder or monitor nozzles. Contain fire control agents for later disposal. Avoid inhaling hazardous vapors. Keep upwind. Remove container from fire area if possible and without risk. Dyke fire control water for later disposal. Do not scatter the material. Avoid pollution of waterways. Do not use high volume water jet, due to contamination risk. Contain water used for firefighting for later disposal. Avoid the accumulation of polluted run-off from the site.

PERSONAL PROTECTIVE EQUIPMENT: Fire-fighters and others that may be exposed should wear full chemical protective clothing and self-contained breathing apparatus. See section 8 for recommendations regarding Exposure Controls/Personal Protection. Fire may produce irritating or poisonous vapors (toxic oxides of carbon, nitrogen and Sulphur) of combustion.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions:

Do not breathe in dust or fumes. Avoid contact with skin and eyes. For personal protection see Section 8.

Environmental precautions:

Do not allow entering drains or watercourses. Mancozeb is toxic to fish. In case of accidental spill, prevent the material from getting into lakes, rivers and other bodies of water. Isolate discharged material and keep material out of water sources. Spillage or uncontrolled discharges into water courses (or public waters) to be reported immediately to the Police and to the Department of Water/Environmental Affairs.

Occupational spill:

Keep spectators away and upwind. Remove all sources of flames and sparks. For dry spills, shovel up and sweep up with damp earth or sand or other suitable absorbents, taking care not to raise a dust cloud. Place the material into a labelled, clean, dry container and cover for subsequent disposal; and store in a safe place to await proper disposal. All contaminated cleaning materials should be placed in closable receptacles. Dispose of the containers in accordance with local regulations. Open burning or dumping of this material is prohibited. Do not flush spilled material into drains.

In situations where product comes in contact with water, contain contaminated water for later disposal. Do not contaminate water while cleaning equipment or disposing of wastes.

SECTION 7 - HANDLING AND STORAGE

KEEP OUT OF REACH OF CHILDREN!

Handling:

Wear appropriate protective equipment when handling the product. Do not handle material near food, feed or drinking water. Avoid contact with eyes, prolonged contact with skin, and inhalation of dust and vapour. Avoid high concentrations of dust in air and accumulation of dust on equipment. An airborne dust of this material can create a dust explosion. Use with adequate ventilation to control dust and reduce exposure to vapours. Protect all equipment from explosions. Wash hands before eating, drinking, chewing gum, smoking, or using the toilet. Remove clothing immediately if the product gets inside. Then wash skin thoroughly using a non-abrasive soap and put on clean clothing. Do not apply directly to areas where surface water is present, or to intertidal areas below the mean high water mark. Water used to clean equipment must be disposed of correctly to avoid contamination. Local regulations should be complied with.

Storage:

Store the product in its original labelled container in cool, dry, well-ventilated area, away from heat, sparks and other sources of ignition. No smoking is allowed. Protect the product from temperatures below 00C and above 480C. Product is combustible, do not ignite. Do not allow the product to become wet or overheated in storage, decomposition, impaired activity or fire may result. Check for hot containers and immediately remove to open areas for disposal. Do not store next to food, feed and water supplies. Keep out of reach of unauthorized persons, children and animals. Avoid breaking the containers, spillage or leaks. Comply with the local regulations.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

Provide adequate ventilation. The measures appropriate for a particular work site depend on how this material is used and on the extent of exposure. Ensure that control systems are properly designed and maintained. Comply with occupational safety, environmental, fire, and other applicable regulations.

Acceptable Exposure Limit (AEL)	
Name	Occupational exposure limit values
Mancozeb	8 hour TWA, total dust: 2 mg/m ³ 12 hour TWA, total dust: 1.5 mg/m ³
Hexamethylene tetramine	8 hour TWA, total dust: 1 mg/m ³

PERSONAL PROTECTIVE EQUIPMENT:

Respirator: Wear an approved full-face respirator suitable for protection from dusts and mists of pesticides is required. Limitations of respirator use specified by the approving agency and the manufacturer must be observed.

Clothing:

Wear appropriate chemical-resistant protective clothing or other impervious clothing. Wear boots, hat and equipment to prevent repeated or prolonged skin contact with this substance. Do not wear leather clothing. Wash clothing after use.

Gloves:

Wear appropriate chemical-resistant protective gloves whenever the product is handled to prevent contact with this substance. Wash gloves after use.

Eye protection:

Use safety goggles and face-shield which is compatible with respiratory equipment.



Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, an eye wash fountain or appropriate alternative within the immediate work area for emergency use, must be provided.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Greyish-yellow, homogenous, fine and free flowing wettable powder
Odor:	Slightly fishy odor (Light Sulphur).
pH:	6.0 to 9.0 (dispersed at 1%)
Melting Point:	Decomposes before melting
Boiling Point/Freezing Point:	NA
Flash Point:	Did not ignite
Evaporation Rate:	NA
Flammability (Solid):	Not flammable
Flammability Limits:	NA
Vapor Pressure:	NA
Vapor Density:	NA

Density:	Bulk Density: 0.430 g/m ⁻³ Tap Density: 0.446 g/m ⁻³ Pour Density: 0.400 g/m ⁻³
Solubility:	The mixtures with water, ethanol and hexane showed separation of insoluble material in the two tested doses (maximum and minimum).
Partition Coefficient:	NA
Auto-Ignition Temperature:	157.5 °C
Decomposition Temperature:	NA
Viscosity:	NA
Explosive Properties:	No explosion reaction is expected. Dust-air mixtures may explode when in contact with moist.
Dust explosion limits:	(LEL): in air: 80 g/m ³
Oxidizing Properties:	Vigorous reaction with cellulose
Corrosion:	It is not corrosive to stainless steel; Aluminum: 0.0313 mm / year; Copper: 0.0380 mm / year; Iron: 0.1544 mm / year; Brass: 0.0204 mm / year

*Listed density is an approximate value and does not necessarily represent that of a specific batch.

SECTION 10 - STABILITY AND REACTIVITY

Stability:

Considered stable in unopened original packages, under normal, dry storage conditions. Reacts with acids and oxidizing agents.

Storage stability:

Stable for 2 years under normal, dry storage conditions in unopened packages. Avoid extremes of temperature; below 0 °C and above 48 °C. Do not exceed 35 °C in storage of quantities greater than 1 cubic meter. Elevated temperature, moisture and oxygen break down the product and induce flammable and toxic gas.

Incompatibility:

Avoid contact with oxidizing agents and acids. Keep away from moisture, heat or flame. Compatible with most commonly used fungicides and insecticides, used at recommended rates. Always perform a compatibility test before using with other products. Do not physically mix concentrate directly with other pesticide concentrates, always dilute first. Not compatible with quaternary agents and sequestering agents. Thermal decomposition: May yield toxic oxides of carbon, nitrogen and Sulphur. Avoid temperatures above 48 °C.

Hazardous decomposition products:

Products of hydrogen sulfide, carbon oxides, nitrogen oxides, sulfur dioxide and carbon disulfide form on heating. During processing, dust may form explosive mixture in air. Decomposition by contact with water may generate vapors which can be ignited by heat or open flame.

SECTION 11 - TOXICOLOGICAL INFORMATION

Acute toxicity data from similar formulation

ACUTE TOXICITY:

Acute oral LD₅₀ >5,000 mg/Kg rats

Acute dermal LD₅₀ >2,000 mg/Kg

Acute inhalation LC₅₀

Mancozeb technical: >2.0 mg/L

Eye Irritation: The product may cause mild to moderate irritation to the eyes.

Skin Irritation: The product may cause mild irritation to the skin.

Dermal sensitization:

The product may cause mild skin sensitization in humans. Prolonged or repeated contact with skin can cause allergic reactions in susceptible persons.

Carcinogenicity:

In long-term studies with mice no evidence of carcinogenicity was observed. A two-year feeding study of mancozeb indicated thyroid tumors in rats at a dietary concentration level of 750 ppm. ETU: Two-year feeding studies of ETU produced increased incidence of thyroid and pituitary tumors in rats at dietary concentrations of 83 ppm and higher and also thyroid, pituitary and liver tumors in mice at 330 ppm and higher. Information on the mechanism of these tumors establishes a threshold for the thyroid and pituitary tumors, and indicates that none of these tumor types is relevant for human risk assessment at likely exposure levels.

Mutagenicity:

Animal in vitro and in vivo studies with mancozeb and ETU suggest that mancozeb and ETU are not mutagenic in mammalian systems.

Teratogenicity:

In two-generation reproduction studies of mancozeb and ETU not any teratogenic effects were detected. In developmental studies, exposure to maternally toxic levels of mancozeb produced developmental effects including malformations in rats. There was no evidence of developmental toxicity in rats below adult toxic levels or in rabbits at any dose. ETU: In developmental toxicity studies with ETU, malformations were produced at thyroid-inhibiting levels in studies with rats and hamsters. Embryofetotoxicity, but no malformations were produced in mice and rabbits, and there was no evidence of developmental toxicity in guinea pigs or cats. The overall NOEL is 5 to 15 mg/kg bw/day in rats.

Acceptable Daily Intake (ADI):

Mancozeb:	0.05 mg/Kg bw/day
Ethylenebisdithiocarbamates as a group:	0.03 mg/Kg bw/day
ETU:	0.04 mg/Kg bw/day

SECTION 12 - ECOLOGICAL INFORMATION**Degradability:**

Mancozeb is rapidly degraded in the environment by hydrolysis, oxidation, photolysis, and metabolism. Is strongly adsorbed to soil, and half-life in soil is 3 to 11 days (clay and loam soil).

Mobility:

The product has low mobility and is not likely to leach.

Accumulation:

The product shows little tendency to bio-accumulate. Bioaccumulation: log POW = 0.66 (pH 7).

ECOTOXICOLOGY:**Birds: Slightly toxic to birds.**

Acute LD ₅₀ : 10 day:	Japanese quail:	> 5,500 mg/Kg
	Mallard Duck:	> 5,500 mg/Kg
Acute dietary LC ₅₀ : 8 day:	Bobwhite quail:	> 5,200 mg/Kg
	Mallard ducks:	> 5,200 mg/Kg

Fish: Highly toxic to fish and aquatic organism.

LC ₅₀ (96hrs, flow-through):	Rainbow trout	1 mg/l
	Bluegill sunfish	> 3.6 mg/l

Daphnia: Very Toxic to daphnia EC₅₀ (48hrs): < 1 mg/l

Algae: Very Toxic to algae LC₅₀ (72hrs): < 1 mg/l

Honeybees: Not toxic to bees LC₅₀: 0.193 mg/bee

Earthworms: Not toxic to bees LC₅₀: > 1000 mg/Kg

SECTION 13 - DISPOSAL CONSIDERATIONS

Pesticide and container disposal:

Open dumping or burning of this pesticide is prohibited. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage into water systems. Do not contaminate rivers, dams or any other water sources with the product or used containers. Dispose of product waste only in a responsible manner and according to local legislation.

Package product wastes:

Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed. Empty the container of excess product by emptying it over or into the container or mixing tank of the applicator. Destroy the emptied containers by perforation and flattening. Do not re-use the empty container for any other purpose. Do not burn the empty container. Dispose of the empty containers only in a responsible manner and according to local legislation.

Comply with any local legislation applying to disposal.

Prevent contamination of food, feedstuffs, drinking water and eating utensils.

SECTION 14 - TRANSPORT INFORMATION

UN NUMBER: 3077
ADR/RD: N/A
Packaging group: III
Class: 9
Shipping Name: Environmentally Hazardous Substance, Solid, N.O.S. (Mancozeb 80%)

IMDG/IMO: N/A
Packaging group: III
Class: 9
Shipping Name: Environmentally Hazardous Substance, Solid, N.O.S. (Mancozeb 80%)

MARINE POLLUTANT
MARKING:



SECTION 15 - REGULATORY INFORMATION

Symbol: Xi, N
Indication of danger: Irritant, Environmentally Hazardous Substance.
Risk phrases:
R 36/37/38 Irritating to eyes, respiratory system and skin.
R 40 Limited evidence of a carcinogenic effect.
R 43 May cause sensitization by skin contact.
R 44 Risk of explosion if heated under confinement
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety phrases:
S 2 Keep out of the reach of children.
S 8 Keep container dry.
S 13 Keep away from food, drink and animal feeding stuffs.
S 20/21 When using, do not eat, drink or smoke.
S 22 Do not breathe dust.
S 24/25 Avoid contact with skin and eyes.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 47/49 Keep only in original container at a temperature not exceeding 48 OC.

S 61

Avoid release to the environment. Refer to special instructions/safety data sheets


SECTION 16 - OTHER INFORMATION**Packing and Labelling**

Packed in 250 g, 500 g and 1, 2, 5 & 10 kg plastic containers or bags and in 5, 10, 20, 25 & 50 kg 3-ply paper bags or polyprop woven bags. Labelled according to South African regulations and guidelines.

Disclaimer:

The information on this sheet is not a specification; it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage use of the product. It is not applicable to unusual or non-standard uses of the product, nor where instructions or recommendations are not followed.

All information is given in good faith but without guarantee in respect of accuracy, and no responsibility is accepted for errors and omissions or the consequence thereof.

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