Global Product Strategy (GPS) Safety Summary

Mancozeb Technical

This GPS Safety Summary is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet and the Product Stewardship Bulletin (PSB).

Chemical Identity

Name: Mancozeb Technical
Brand names: NA
Chemical name (IUPAC): *zinc; manganese(2+); N-[2-(sulfidocarbothioylamino)ethyl]carbamodithioate*
CAS number: 8018-01-7
EC number: 616-995-5
Molecular formula: $C_4H_6MnN_2S_4$. $C_4H_6MnN_2S_4Zn$.

Uses and Applications

Mancozeb Technical is the active ingredient form of a widely used agricultural fungicide, known for its broad-spectrum efficacy against a variety of fungal pathogens. As a foundational component in the formulation of various fungicidal products, Mancozeb Technical plays a critical role in the protection of numerous crops including fruits, vegetables, cereals, oilseeds, and ornamental plants.

The primary use of Mancozeb Technical is in the formulation of fungicides such as wettable powders (WP), dusts, and other application-ready products. These formulations are extensively used to combat foliar fungal diseases like blights, rusts, downy mildew, leaf spots, and anthracnose. It is particularly valued for its effectiveness in controlling late blight in potatoes and tomatoes, early blight, and leaf spot diseases across a wide range of crops.

Mancozeb Technical functions as a multi-site contact fungicide, disrupting multiple enzyme processes within fungal cells and thereby preventing their growth and reproduction. This mode of action not only provides reliable disease control but also reduces the likelihood of resistance development.

In modern agricultural practices, Mancozeb Technical is often used as part of integrated disease management (IDM) strategies. It is commonly blended with systemic fungicides in formulated products to enhance disease control efficacy and manage resistance. Its role as a preventive fungicide means it is most effective when applied before the onset of visible symptoms, offering a protective barrier on plant surfaces.

Due to its widespread application and environmental impact, the production and use of Mancozeb Technical are subject to regulatory oversight. Manufacturers and formulators must adhere to strict quality standards and safety guidelines to ensure the responsible and sustainable use of the compound. Attention to application rates, formulation stability, and environmental safety is critical to minimizing risks to human health and non-target organisms.

Physical / Chemical Properties

At ambient temperature Mancozeb is a yellowish-to-Yellowish Green coloured homogenous powder, Musty like Odor, the substance is of relatively low molecular weight and Mancozeb is non-flammable under normal conditions. The flash point of Mancozeb is146 deg. C (open), meaning it does not easily ignite at standard temperatures Boiling Point: The boiling point of Mancozeb is Decomposition 192-204 deg. C.

Health Effects

Mancozeb is classified under the GHS as hazardous due to its potential for acute toxicity and single exposure target organ toxicity, particularly affecting the nervous system. Prolonged or repeated exposure may result in organ damage, especially to the thyroid, liver, and nervous system.

The table below gives an overview of the health effects assessment results for Mancozeb.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Can cause systemic toxicity. Targets include the blood and eyes. Symptoms range from mild irritation to severe systemic effects. Inhalation of dust or aerosols may result in significant toxic effects, targeting similar organs (CNS, blood, eyes).
Irritation / corrosion Skin / eye/ respiratory tract	Not irritating to skin and Mild eye irritation
Sensitization	May cause sensitization by skin contact.
Toxicity after repeated exposure Oral / inhalation / dermal	Health risks from repeated exposure primarily involve neurotoxicity, attributed to acetylcholinesterase inhibition. This can impair nerve function and lead to symptoms such as headaches, weakness, dizziness effects with chronic exposure.
Genotoxicity / Mutagenicity	limited genotoxic risk
Toxicity for reproduction	Potential reproductive toxicity is observed at high exposure levels. However, it is generally considered safe under normal use and exposure conditions.

Environmental Effects

Mancozeb Technical is Moderately toxic to aquatic life under the Globally Harmonized System (GHS) due to its potential to cause harmful effects in aquatic ecosystems.

The table below gives an overview of the environmental assessment results for Mancozeb.

Effect Assessment	Result
Aquatic Toxicity	Slightly toxic to aquatic life under the Globally Harmonized System (GHS) due to its potential to cause harmful effects in aquatic ecosystems.

Fate and behaviour	Result
Biodegradation	Moderately biodegradable
Bioaccumulation potential	Low potential Bioaccumulation

PBT / vPvB conclusion	Not classified as PBT (Persistent, Bio-accumulative, Toxic) or vPvB (very Persistent, very Bio-accumulative)

PBT = Persistent, Bio-accumulative and Toxic in the environment.
vPvB = very Persistent and very Bio-accumulative in the environment.

Exposure

Mancozeb Technical is a broad-spectrum fungicide used in the formulation of various crop protection products. Due to its concentrated nature, special care must be taken during handling, manufacturing, or formulation processes to prevent exposure and protect human health.

General Safety Guidelines for Handling Mancozeb Technical:

- Read and Follow Safety Protocols: Prior to use, consult the Safety Data Sheet (SDS) and ensure all personnel are familiar with the chemical's properties, potential hazards, and first aid measures.
- Use in Well-Ventilated Areas: Adequate ventilation or appropriate exhaust systems must be in place to minimize the risk of inhaling dust or vapors.
- Avoid Direct Contact: Mancozeb Technical should not come into contact with skin, eyes, or clothing. Do not ingest or inhale the product.
- Personal Protective Equipment (PPE):
  – Wear chemical-resistant gloves and protective coveralls when handling the product.
  – Use safety goggles or a full-face shield to protect against splashes.
  – In dusty environments or confined spaces, wear a suitable respirator (e.g., NIOSH-approved mask) to avoid inhalation of airborne particles.
- Hygiene Practices: Wash hands and exposed skin thoroughly with soap and water after handling. Contaminated clothing should be removed and laundered before reuse.

Potential Health Effects:

- Acute Exposure: May cause skin and eye irritation. Inhalation of dust can lead to respiratory tract irritation.
- Chronic Exposure: Prolonged or repeated exposure may affect the thyroid and liver based on animal studies. It is important to limit cumulative exposure.
- First Aid Measures:
  - Inhalation: Move the person to fresh air and seek medical attention if symptoms persist.
  - Skin Contact: Wash immediately with soap and water. Seek medical advice if irritation develops.
  - Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do.
  - Ingestion: Do not induce vomiting. Seek immediate medical attention.

Environmental Note:

While this document focuses on human health, it's important to note that Mancozeb is toxic to aquatic life. Care must be taken to avoid contamination of water bodies during handling and disposal.

Human health

When handling Mancozeb Technical in industrial or professional environments, strict adherence to safety

protocols is crucial to minimize health risks. As a concentrated raw material, Mancozeb Technical requires more rigorous controls than formulated products. Appropriate safety measures must be in place to ensure safe handling, especially in enclosed or poorly ventilated areas.

General Guidelines for Use:

- ✓ Read and Understand All Safety Documentation: Always consult and comply with the product's Safety Data Sheet (SDS), technical labels, and internal handling procedures before use.
- ✓ Maintain Adequate Ventilation: Ensure that workspaces are well-ventilated, particularly during handling, weighing, or transferring of Mancozeb Technical, to reduce the risk of inhaling dust or vapours.
- ✓ Minimize Direct Contact: Prevent contact with skin, eyes, and clothing by using engineered controls and handling aids whenever possible.
- ✓ Wear Proper Personal Protective Equipment (PPE):
    - Chemical-resistant gloves (e.g., neoprene)
    - Long-sleeved coveralls or protective clothing
    - Safety goggles or a face shield
    - Approved respiratory protection in dusty or confined areas
- ✓ Follow Good Hygiene Practices: Do not eat, drink, or smoke while handling the material. Wash hands, face, and any exposed skin thoroughly after use. Remove contaminated clothing and wash before reuse.

Health Considerations:

Inhalation Risks: Dust from Mancozeb Technical may cause respiratory irritation. Prolonged inhalation should be avoided.

- Skin and Eye Contact: Direct contact may cause irritation; proper protection reduces this risk significantly.
- Long-Term Exposure: Repeated exposure, especially without protection, may lead to adverse health effects based on toxicological studies. Proper risk assessments should be carried out for frequent handlers.

Emergency Measures:

- In case of inhalation, move to fresh air and seek medical attention if symptoms occur.
- For skin contact, wash thoroughly with soap and water.
- If eye exposure occurs, rinse immediately with clean water for several times and seek medical advice.
- If ingested, do not induce vomiting, seek immediate medical attention.

Risk Management Measures:

To ensure worker safety and minimize the risk of exposure:

- Implement closed and automated systems where possible.
- Use local exhaust ventilation (LEV) or general ventilation in work areas.
- Conduct regular exposure monitoring to detect and manage any potential emissions or contamination.
- Require the use of appropriate personal protective equipment (PPE) including:
    - Chemical-resistant gloves
    - Respirators or dust masks, if airborne particles are present

- Protective clothing and eye protection

Environment
Mancozeb Technical is produced through controlled, automated manufacturing processes aimed at minimizing environmental impact. During storage, handling and transportation, stringent safety protocols are implemented to prevent accidental releases or contamination of soil, water, and air. Proper management of Mancozeb Technical ensures environmental protection throughout its lifecycle.

Environmental Protection Measures:
- Avoid Discharge into the Environment: It is critical to prevent any unintentional release of Mancozeb Technical into the environment.
- Closed-System Handling: Product transfer operations are performed within closed systems or using sealed containers to prevent leaks, spills, or emissions.
- Spill Response Procedures:
  - If a spill occurs, take immediate action to prevent further leakage or spillage, but only if it is safe to do so.
  - Contain the spill to prevent environmental contamination, particularly in areas that could impact water bodies or soil.
  - Collect any contaminated wash water and dispose of it through approved channels.
  - In the event of a large or uncontainable spill, promptly notify local environmental authorities for appropriate response actions.

Precautions for Safe Handling and Transport:
- Storage: Store Mancozeb Technical in a secure, well-ventilated area, away from water sources or natural habitats.
- Transportation: Ensure that all transport equipment is sealed and properly secured to prevent leaks or damage during transit.
- Emergency Protocols: Establish and maintain emergency response plans for potential environmental incidents related to Mancozeb Technical, including appropriate spill kits and containment materials.

By following these environmental safety measures, Mancozeb Technical can be safely produced, handled, and transported with minimal impact on the surrounding environment. Ensuring proper adherence to these protocols mitigates the risk of contamination and protects ecological health.

Risk Management Measures
For detailed guidance on the use of Mancozeb Technical, the Safety Data Sheet and the Product Safety Bulletin should be consulted.

Mancozeb Technical should be handled only by knowledgeable and trained personnel.

Flammability
Mancozeb is non-flammable under normal conditions

Human health
To minimize risks associated with the handling and use of Mancozeb Technical, strict adherence to safety protocols and good industrial hygiene practices is essential.

1. **Ventilation & Personal Protective Equipment (PPE)**
   - Ensure adequate ventilation in work areas, especially during mixing, application, or transfer processes.
   - Always wear: Chemical-resistant gloves, Protective goggles or face shield and Protective clothing such as coveralls or long-sleeved garments (preferably non-permeable)
2. **Hygiene Practices**
   - Do not eat, drink, or smoke in areas where Mancozeb is handled or stored.
   - After any contact, wash hands and exposed skin thoroughly with soap and water.
   - If eye contact occurs, rinse immediately with clean water for at least 15 minutes, and seek medical attention.
3. **Transfer & Maintenance Procedures**
   - Flush or drain lines into a closed system to avoid spillage or exposure.
   - Ensure tanks and systems are depressurized and sealed before opening.
   - Follow proper lock-out/tag-out (LOTO) and safety procedures.
4. **Additional Risk Management Measures**
   - Use full chemical-resistant suits
   - Utilize supplied-air respirators or self-contained breathing apparatus (SCBA) in high-risk areas.

Environmental

In case of accidental release or spill, do not allow the product to enter sewers, surface or ground water.

Regulatory Information / Classification and Labelling

REACH - Candidate List of Substances of Very High Concern for Authorization (Article 59).	: Not Applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	: Not Applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	: Not Applicable
REACH - List of substances subject to authorization (Annex XIV)	: Not Applicable
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	: Environmental Hazards

Conclusion Statements

- Mancozeb Technical is a highly effective, broad-spectrum fungicide used in the formulation of various agricultural products. It is primarily employed to control a wide range of fungal diseases in crops, including fruits, vegetables, and field crops. The active ingredient works by inhibiting fungal enzyme activity, thus preventing spore germination and hindering fungal growth.

- Mancozeb Technical is classified as hazardous under the Globally Harmonized System (GHS) due to its potential for acute toxicity, skin and eye irritation, and reproductive toxicity at high exposure levels. Long-term or repeated exposure may lead to neurotoxic effects, primarily due to its breakdown products and the potential to inhibit acetylcholinesterase.

- Worker and environmental exposure to Mancozeb Technical is generally considered low to moderate. This is due to the controlled and enclosed systems used during manufacturing, storage, and handling. Risk is further minimized by the use of engineering controls, appropriate personal protective equipment (PPE), and stringent environmental protection measures to prevent accidental releases and contamination.

Contact Information within Company

For further information on this product in general, please consult the Coromandel International limited corporate website (https://www.coromandel.biz/)

Date of issue

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Disclaimer

The above information is intended to give general health and safety guidance on the storage and transport of the substance or product to which it relates. The requirement or recommendation of any relevant site or working procedure, system or policy in force or arising from any risk assessment involving the substance or product should take precedence over any of the guidance contained in this safety data sheet where there is a difference in the information given. The information provided in this safety data sheet is accurate at the date of publication and will be updated as and when appropriate. No liability will be accepted for any injury loss or damage resulting from any failureto take account of information or advice contained in this safety data sheet.

End of GPS Sheet