

Mankocide® Fungicide/Bactericide

Version 1.0

Revision Date 04/8/2015

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Mankocide® Fungicide/Bactericide
Tradename/Synonym : Mankocide DF
B12262770
Mancozeb: A coordination product of zinc ion and manganese ethylenebisdithiocarbamate in which the ingredients are Manganese 3.0%, Zinc 0.4%, Ethylenebisdithiocarbamate ion 11.6%
Copper Hydroxide: Metallic Copper Equivalent - 30%

EPA Registration No. : 91411-7-70051

MSDS Number : 130000030100

Manufacturer : DuPont
1007 Market Street
Wilmington, DE 19898

Distributed by: Certis USA L.L.C.
9145 Guilford Road, Suite 175
Columbia, MD 21046

Medical Emergency : ChemTel 1-800-255-3924 (outside the U.S. 1-813-248-0585)
Transport Emergency : ChemTel 1-800-255-3924 (outside the U.S. 1-813-248-0585)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

DangerCorrosive

Causes irreversible eye damage. Harmful if swallowed. Harmful if inhaled. Do not get in eyes or on clothing. Avoid breathing dust or spray mist. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

This product is toxic to fish. This product is toxic to: Aquatic invertebrates

Potential Health Effects

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This section includes potential acute adverse effects which could occur if this material is not used according to the label.

Skin

Copper Hydroxide : Irritation

Mancozeb : May cause allergic skin reaction.

Eyes

Copper Hydroxide : Corrosive, may cause permanent eye injury if not promptly treated. May cause: Tearing, pain, redness, swelling, ulceration, visual impairment, or blindness.

Mancozeb : May irritate eyes.

Inhalation

Copper Hydroxide : May cause irritation of respiratory tract. Cough

Mancozeb : Causes respiratory tract irritation.

Ingestion

Copper Hydroxide : Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Metallic taste, Gross overexposure may cause:, Kidney failure, Bloody urine, anemia, Loss of consciousness.

Repeated exposure

Quartz : Kocide LLC has classified this material as a known human carcinogen.

Target Organ

Mancozeb : Thyroid

Carcinogenicity

Material	IARC	NTP	OSHA
Quartz	1	X	

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

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Component	CAS-No.	Concentration
Copper Hydroxide	20427-59-2	46.1 %
Mancozeb	8018-01-7	15 %
Other Ingredients		38.9 %

Present as an impurity in the clay component of this product:

Quartz		<1 %
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SECTION 4. FIRST AID MEASURES

- Skin contact** : Take off all contaminated clothing immediately. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
- Eye contact** : Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
- Inhalation** : Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.
- Ingestion** : Call a poison control center or doctor for treatment advice. Have person sip a glass of water if able to swallow. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Do not give anything by mouth to an unconscious person.

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- General advice : Have the product container or label with you when calling a poison control center or doctor, or going for treatment.
For medical emergencies involving this product, call toll free:
ChemTel 1-800-255-3924 (outside the U.S. 1-813-248-0585)
See Label for Additional Precautions and Directions for Use.
- Notes to physician : Probable mucosal damage may contraindicate the use of gastric lavage.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water spray, Foam, Dry chemical, Carbon dioxide (CO2)
- Unsuitable extinguishing media : High volume water jet, (contamination risk)
- Firefighting Instructions : Wear full protective clothing and self-contained breathing apparatus. Prevent fire extinguishing water from contaminating surface water or the ground water system. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
(on small fires) If area is heavily exposed to fire and if conditions permit, let fire burn itself out since water may increase the area contaminated. Cool containers / tanks with water spray.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

- Safeguards (Personnel) : Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus. Use personal protective equipment.
- Spill Cleanup : Sweep up and shovel into suitable containers for disposal.
Water Spill: If feasible, copper may be precipitated/-ultrafiltrated with caustics or other chemicals and resulting sludge disposed of in a chemical landfill.

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Accidental Release Measures : Prevent material from entering sewers, waterways, or low areas. Never return spills in original containers for re-use. Dispose of in accordance with local regulations.

SECTION 7. HANDLING AND STORAGE

Handling (Personnel) : Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing/PPE immediately if material gets inside. Wash thoroughly and put on clean clothing. Remove personal protective equipment immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Storage : Do not contaminate water, other pesticides, fertilizer, food or feed in storage. Store in original container. Store in a cool, dry place. Keep out of the reach of children.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls : Ensure adequate ventilation. Refer to the product label for additional Engineering Controls.

Personal protective equipment

Hand protection : Material: Protective gloves

Eye protection : Wear protective eyewear to prevent contact with this substance.

Skin and body protection : Mixers, loaders, applicators and other handlers must wear:
Long sleeved shirt and long pants
Shoes plus socks
Chemical resistant gloves made of any waterproof material
Protective eyewear
Personal protective equipment required for early entry:
Coveralls
Shoes plus socks
Chemical resistant gloves made of any waterproof material

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Protective eyewear

Protective measures : Use this product in accordance with its label. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Exposure Guidelines
Exposure Limit Values

Copper Hydroxide AEL *	(KOCIDE)	1.5 mg/m3	8 & 12 hr. TWA
Mancozeb PEL:	(OSHA)	5 mg/m3	TLV-C as Mn
AEL *	(KOCIDE)	1 mg/m3	12 hr. TWA Total dust.
AEL *	(KOCIDE)	2 mg/m3	8 hr. TWA Total dust.
Quartz PEL:	(OSHA)	2.4 millions of particles per cubic foot of air	TWA Respirable. Remarks The exposure limit is calculated from the equation, $250/(\%SiO_2+5)$, using a value of 100% SiO ₂ . Lower percentages of SiO ₂ will yield higher exposure limits.
PEL:	(OSHA)	0.1 mg/m3	TWA Respirable. Remarks The exposure limit is calculated from the equation, $10/(\%SiO_2+2)$, using a value of 100% SiO ₂ . Lower percentages of SiO ₂ will yield higher exposure limits.
PEL:	(OSHA)	0.3 mg/m3	TWA Total dust. Remarks The exposure limit is calculated from the equation, $30/(\%SiO_2+2)$, using a value of 100% SiO ₂ . Lower values of % SiO ₂ will give higher exposure limits.

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TLV	(ACGIH)	0.025 mg/m ³	TWA Respirable fraction.
AEL *	(KOCIDE)	0.01 mg/m ³	12 hr. TWA Respirable dust.
AEL *	(KOCIDE)	0.02 mg/m ³	8 hr. TWA Respirable dust.

* AEL is Kocide's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	: granules
Color	: dark green
pH	: 9.6
Density	: 0.5485 g/cm ³

SECTION 10. STABILITY AND REACTIVITY

Stability	: Stable at normal temperatures and storage conditions.
Conditions to avoid	: None reasonably foreseeable.
Hazardous reactions	: Polymerization will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

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Inhalation 4 h LC50	: > 1.266 mg/l , rat
Dermal LD50	: > 5,000 mg/kg , rabbit
Oral LD50	: 2,535 mg/kg , rat

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- Skin irritation : No skin irritation, rabbit
- Eye irritation : Severe eye irritation, rabbit
Corrosive
- Sensitization : Animal test did not cause sensitization by skin contact., guinea pig

Copper Hydroxide

- Repeated dose toxicity : The following effects occurred at levels of exposure that significantly exceed those expected under labeled usage conditions.

Oral
rat

Liver effects, Kidney effects, microcytic anemia

Information given is based on data obtained from similar substances.

Oral - feed
rat

Spleen effects

Information given is based on data obtained from similar substances.

- Carcinogenicity : Animal testing did not show any carcinogenic effects.

Information given is based on data obtained from similar substances.

- Mutagenicity : Evidence suggests this substance does not cause genetic damage in cultured bacterial cells.
Evidence suggests this substance does not cause genetic damage in animals.

Information given is based on data obtained from similar substances.

- Reproductive toxicity : Animal testing did not show any effects on fertility.

Information given is based on data obtained from similar substances.

- Teratogenicity : The following effects occurred at levels of exposure that significantly

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exceed those expected under labeled usage conditions.
 Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

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Repeated dose toxicity

: The following effects occurred at levels of exposure that significantly exceed those expected under labeled usage conditions.

Inhalation
 rat

Thyroid effects

Oral - feed
 rat

Thyroid effects

Oral - feed
 dog

Thyroid effects

Carcinogenicity

: The following effects occurred at levels of exposure that significantly exceed those expected under labeled usage conditions.

An increased incidence of tumors was observed in laboratory animals.

Mutagenicity

: Did not cause genetic damage in cultured bacterial cells.
 Evidence suggests this substance does not cause genetic damage in cultured mammalian cells.
 Evidence suggests this substance does not cause genetic damage in animals.

Reproductive toxicity

: Animal testing showed no reproductive toxicity.

Teratogenicity

: The following effects occurred at levels of exposure that significantly exceed those expected under labeled usage conditions.

Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

Quartz

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Repeated dose toxicity : Inhalation
 The following effects occurred at levels of exposure that significantly exceed those expected under labeled usage conditions., Fluid retention in lungs (pulmonary oedema), lung effects, Inflammation, Chronic lung disease, Fibrosis

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity

Copper Hydroxide

96 h LC50 : Oncorhynchus mykiss (rainbow trout) 0.135 mg/l
 72 h ErC50 : Pseudokirchneriella subcapitata (green algae) 0.00939 mg/l
 48 h EC50 : Daphnia magna (Water flea) 0.0422 mg/l
 90 d : NOEC 0.0017 mg/l
 21 d : NOEC 0.03 mg/l

Mancozeb

96 h LC50 : Oncorhynchus mykiss (rainbow trout) 0.073 mg/l
 96 h LC50 : Pimephales promelas (fathead minnow) 0.57 mg/l
 48 h ErC50 : Pseudokirchneriella subcapitata (green algae) 0.43 mg/l
 48 h EC50 : Daphnia magna (Water flea) 0.073 mg/l

Additional ecological information : Environmental Hazards: For Terrestrial Uses: Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters or rinsate. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. See product label for additional application instructions relating to environmental precautions.

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SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal : Do not contaminate water, food or feed by disposal. Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal : Container Refilling and Disposal:
Refer to the product label for instructions.
Do not transport if this container is damaged or leaking.

In the event of a major spill, fire or other emergency, call 1-800-255-3924 (outside the U.S. 1-813-248-0585) day or night.

SECTION 14. TRANSPORT INFORMATION

IATA_C	UN number	: 3077
	Proper shipping name	: Environmentally hazardous substance, solid, n.o.s. (Mancozeb, Copper hydroxide)
	Class	: 9
	Packing group	: III
	Labelling No.	: 9MI
IMDG	UN number	: 3077
	Proper shipping name	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Mancozeb, Copper hydroxide)
	Class	: 9
	Packing group	: III
	Labelling No.	: 9
	Marine pollutant	: yes (Mancozeb, Copper hydroxide)

Not regulated by DOT/49 CFR unless shipped in bulk package or by water.

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SECTION 15. REGULATORY INFORMATION

SARA 313 Regulated Chemical(s)	:	Copper dihydroxide , Mancozeb , Zinc oxide
EPA Reg. No.	:	91411-7-70051 In the United States this product is regulated by the US Environmental Protection Agency (EPA) under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read and follow all label directions. This product is excluded from listing requirements under EPA/TSCA.
California Prop. 65	:	WARNING! This product contains a chemical or chemicals known to the State of California to cause cancer. WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
PA Right to Know Regulated Chemical(s)	:	Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Zinc oxide , Sucrose

SECTION 16. OTHER INFORMATION

	NFPA	HMIS
Health :	2	2
Flammability :	1	1
Reactivity/Physical hazard :	0	0

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Contact person : Kocide LLC, 9145 Guilford Road, Suite 175, Columbia, MD, 21046-1883
Phone: 1-301-604-5365

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at

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the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.