

1. IDENTIFICATION

Product identifier

Product Name ManKocide® Fungicide/Bactericide

Other means of identification

Product Code 91411-7
Synonyms ManKocide DF, B12262770
Registration Number(s) 91411-7-70051

Recommended use of the chemical and restrictions on use

Recommended Use Fungicide Bactericide
Uses advised against No information available

Details of the supplier of the safety data sheet

Manufacturer Address
 Kocide LLC
 9145 Guilford Road, Suite 175
 Columbia, MD 21046
 USA
 Website: www.kocide.com

Distributed by:
 Certis U.S.A. L.L.C.
 9145 Guilford Road, Suite 175
 Columbia, MD 21046
 USA
 www.certisusa.com

Emergency telephone number

Company Phone Number Certis USA +1 301-604-7340
Emergency Telephone ChemTel, Inc.: 1-800-255-3924 (outside the U.S. 1-813-248-0585)
 POISON CONTROL CENTER: 800-222-1222

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Serious eye damage/eye irritation	Category 1
Skin sensitization	Category 1
Carcinogenicity	Category 1A
Reproductive toxicity	Category 2

Label elements

Emergency Overview

Danger

Hazard statements

Harmful if swallowed
 Harmful if inhaled
 Causes serious eye damage
 May cause an allergic skin reaction
 May cause cancer
 Suspected of damaging fertility or the unborn child



Appearance granules

Physical state Solid

Odor Characteristic

Precautionary Statements - Prevention

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN: Wash with plenty of soap and water
If skin irritation or rash occurs: Get medical advice/attention
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Not applicable

Other Information

May be harmful in contact with skin. Very toxic to aquatic life with long lasting effects. Very toxic to aquatic life.

Unknown acute toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Name	CAS No	Weight-%
Copper hydroxide	20427-59-2	46.1
Other ingredients	Proprietary	22.2
Mancozeb	8018-01-7	15.0
Bentonite	1302-78-9	13 - 14
Zinc oxide	1314-13-2	3 - 4
Quartz	14808-60-7	0.1 - 1

If CAS number is "proprietary", the specific chemical identity and percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

General advice	Call a poison control center or doctor for treatment advice. Have the product containers or label with you when calling a poison control center or doctor, or going for treatment.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison control center or doctor for treatment advice.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse. If skin irritation persists, call a physician. Call a poison control center or doctor for treatment advice.
Inhalation	Move victim to fresh air. If breathing is irregular or stopped, administer artificial respiration. Call a physician or poison control center immediately. Call a poison control center or doctor for treatment advice.
Ingestion	Call a physician or poison control center immediately. Drink 1 or 2 glasses of water. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Most important symptoms and effects, both acute and delayed

Symptoms	May cause redness and tearing of the eyes. May result in permanent damage including blindness. Repeated contact may cause allergic reactions in very susceptible persons. Coughing and/ or wheezing.
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Indication of any immediate medical attention and special treatment needed

Note to physicians	Probable mucosal damage may contraindicate the use of gastric lavage. Treat symptomatically.
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5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Dry chemical, CO₂, water spray or regular foam. Move containers from fire area if you can do it without risk. Dike fire-control water for later disposal.

Unsuitable extinguishing media Do not scatter spilled material with high pressure water streams.

Specific hazards arising from the chemical

Thermal decomposition can lead to release of irritating and toxic gases and vapors. Runoff may pollute waterways.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Cool containers / tanks with water spray.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Ensure adequate ventilation, especially in confined areas. Avoid creating dust.

For emergency responders Use personal protection recommended in Section 8. Ventilate the area.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

Methods and material for containment and cleaning up

Methods for containment Prevent dust cloud. Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Avoid creating dust. Do not dry sweep dust. Wet dust with water before sweeping or use a vacuum to collect dust. Sweep up and shovel into suitable containers for disposal. Do not place spilled materials back into the original container.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Avoid generation of dust. Use personal protective equipment as required. Do not breathe dust. Avoid contact with skin, eyes or clothing. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place. Keep in properly labeled containers. Keep out of the reach of children. Keep away from food, drink and animal feeding stuffs. Keep away from heat. Keep away from sources of ignition - No smoking.

Packaging materials Do not reuse container.

Incompatible materials Strong acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Copper hydroxide 20427-59-2	TWA: 1 mg/m ³ Cu dust and mist	-	IDLH: 100 mg/m ³ Cu dust and mist TWA: 1 mg/m ³ Cu dust and mist
Mancozeb 8018-01-7	-	Ceiling: 5 mg/m ³ Mn	IDLH: 500 mg/m ³ Mn TWA: 1 mg/m ³ Mn STEL: 3 mg/m ³ Mn
Bentonite 1302-78-9	TWA: 1 mg/m ³ respirable fraction	-	-

Zinc oxide 1314-13-2	STEL: 10 mg/m ³ respirable fraction TWA: 2 mg/m ³ respirable fraction	TWA: 5 mg/m ³ fume TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction	IDLH: 500 mg/m ³ Ceiling: 15 mg/m ³ dust TWA: 5 mg/m ³ dust and fume STEL: 10 mg/m ³ fume
Quartz 14808-60-7	TWA: 0.025 mg/m ³ respirable fraction	: (30)/(%SiO ₂ + 2) mg/m ³ TWA total dust : (250)/(%SiO ₂ + 5) mppcf TWA respirable fraction : (10)/(%SiO ₂ + 2) mg/m ³ TWA respirable fraction	IDLH: 50 mg/m ³ respirable dust TWA: 0.05 mg/m ³ respirable dust

NIOSH IDLH *Immediately Dangerous to Life or Health*

Appropriate engineering controls

Engineering Controls Ensure adequate ventilation, especially in confined areas. Showers. Eyewash stations. Ventilation systems.

Individual protection measures, such as personal protective equipment

- Eye/face protection** Wear safety glasses with side shields (or goggles). If splashes are likely to occur: Wear suitable face shield.
- Skin and body protection** Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
- Respiratory protection** Ensure adequate ventilation, especially in confined areas. Respiratory protection. Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100.

General Hygiene Considerations When using do not eat, drink or smoke. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Wash hands thoroughly after handling. Keep away from food, drink and animal feeding stuffs. Wash contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Solid	Odor	Characteristic
Appearance	granules	Odor threshold	No information available
Color	dark blue		
Property	Values	Remarks • Method	
pH	8.0 - 10.5	solution (1 %)	
Melting point / freezing point	No information available		
Boiling point / boiling range	No information available		
Flash point	Not applicable		
Evaporation rate	No information available		
Flammability (solid, gas)	No information available		
Flammability Limit in Air			
Upper flammability limit:	No information available		
Lower flammability limit:	No information available		
Vapor pressure	0 mmHg	@ 25 °C	
Vapor density	No information available		
Relative density	1.0 - 1.2 g/cc		
Water solubility	slightly soluble		
Solubility in other solvents	No information available		
Partition coefficient	No information available		
Autoignition temperature	No information available		
Decomposition temperature	No information available		
Kinematic viscosity	No information available		

Dynamic viscosity	No information available
Explosive properties	Not an explosive
Oxidizing properties	Not applicable

Other Information

Softening point	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Density	No information available
Bulk density	~34 lb/cu ft

10. STABILITY AND REACTIVITY

Reactivity

No data available

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to avoid

Storage near to reactive materials. Temperatures above 140 °C / 284 °F.

Incompatible materials

Strong acids.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure**Product Information**

Acute Oral LD50 (rat): 2535 mg/kg
 Acute Dermal LD50 (rabbit): > 5000 mg/kg
 Eye Irritation (rabbit): Corrosive.
 Skin Irritation (rabbit): Not an irritant.
 Inhalation LC50 (rat): >1.266 mg/L (4 HR)
 Skin Sensitization (guinea pig): May cause an allergic skin reaction

Inhalation

Harmful by inhalation.

Eye contact

Corrosive to the eyes and may cause severe damage including blindness.

Skin contact

Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

Ingestion

Harmful if swallowed.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Copper hydroxide 20427-59-2	= 489 mg/kg (Rat)	> 2000 mg/kg (Rat)	= 0.5 mg/L (Rat) 4 h
Other ingredients	> 40 g/kg (Rat)	-	-
Mancozeb 8018-01-7	= 5 g/kg (Rat)	> 5 g/kg (Rabbit) > 10 g/kg (Rat)	-
Bentonite 1302-78-9	> 5000 mg/kg (Rat)	-	-
Zinc oxide 1314-13-2	> 5000 mg/kg (Rat)	-	-
Quartz 14808-60-7	= 500 mg/kg (Rat)	-	-

Information on toxicological effects

Symptoms May cause redness and tearing of the eyes. May result in permanent damage including blindness. May cause an allergic skin reaction.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization May cause sensitization by skin contact.
Germ cell mutagenicity Based on available data, the classification criteria are not met.
Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Zinc oxide 1314-13-2	-	-	Reasonably Anticipated	X
Quartz 14808-60-7	A2	Group 1	Known	X

ACGIH (American Conference of Governmental Industrial Hygienists)

A2 - Suspected Human Carcinogen

IARC (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

NTP (National Toxicology Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X - Present

Reproductive toxicity Product is or contains a chemical which is a known or suspected reproductive hazard.
STOT - single exposure Based on available data, the classification criteria are not met.
STOT - repeated exposure Based on available data, the classification criteria are not met.
Chronic toxicity Avoid repeated exposure. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.
Target Organ Effects Central nervous system, Eyes, Thyroid, kidney, blood, liver, Respiratory system, Skin.
Other adverse effects 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, Thyroid effects, Liver effects, Kidney effects, Microcytic anemia, Spleen effects.
Aspiration hazard Based on available data, the classification criteria are not met.

Numerical measures of toxicity - Product Information

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral)	953.00 mg/kg
ATEmix (dermal)	3,843.00 mg/kg
ATEmix (inhalation-dust/mist)	1.3 mg/l

12. ECOLOGICAL INFORMATION**Ecotoxicity**

Very toxic to aquatic life with long lasting effects. This pesticide is toxic to fish and aquatic invertebrates and may contaminate water through runoff. This product has a potential for runoff for several months or more after application. Poorly draining soils and soils with shallow water tables are more prone to produce runoff that contains this product. For terrestrial uses, do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash-waters or rinsate. Drift and runoff may be hazardous to aquatic organisms in waters adjacent to treated areas.

22.5 % of the mixture consists of component(s) of unknown hazards to the aquatic environment

Chemical Name	Algae/aquatic plants	Fish	Crustacea
Copper hydroxide 20427-59-2	0.00939: 72 h Pseudokirchneriella subcapitata mg/L EC50	0.135: 96 h Oncorhynchus mykiss (rainbow trout) mg/L LC50	0.0422: 48 h Daphnia magna mg/L EC50
Mancozeb 8018-01-7	-	1: 48 h Lepomis macrochirus mg/L LC50	-
Bentonite 1302-78-9	-	19000: 96 h Oncorhynchus mykiss mg/L LC50 static 8.0 - 19.0: 96 h Salmo gairdneri g/L LC50	-

Persistence and degradability

Not readily biodegradable.

Bioaccumulation

Not likely to bioaccumulate.

Other adverse effects

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)

13. DISPOSAL CONSIDERATIONS**Waste treatment methods****Disposal of wastes**

Pesticide wastes may be acutely hazardous. Improper disposal is a violation of federal law. Disposal should be in accordance with applicable regional, national and local laws and regulations. Contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance on proper disposal of waste product.

Contaminated packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations. Consult product label for additional information. Do not reuse container.

Chemical Name	California Hazardous Waste Status
Copper hydroxide 20427-59-2	Toxic
Mancozeb 8018-01-7	Toxic
Zinc oxide 1314-13-2	Toxic

14. TRANSPORT INFORMATION**DOT**

Not regulated (If shipped in NON BULK packaging by ground transport)

This product is regulated by US DOT when shipped in bulk containers as follows: UN3077, Environmentally hazardous substance, solid, n.o.s. (Mancozeb), 9, III; Marine Pollutant

TDG

Not regulated

IATA

UN/ID no UN3077
 Proper shipping name Environmentally hazardous substance, solid, n.o.s.
 Hazard Class 9
 Packing Group III
 ERG Code 9L
 Special Provisions A97, A158, A179, A197
 Description UN3077, Environmentally hazardous substance, solid, n.o.s. (Mancozeb, Copper hydroxide), 9, III

IMDG

UN/ID no UN3077
 Proper shipping name Environmentally hazardous substance, solid, n.o.s.
 Hazard Class 9
 Packing Group III
 EmS-No F-A, S-F
 Special Provisions 274, 335, 966, 967
 Description UN3077, Environmentally hazardous substance, solid, n.o.s. (Mancozeb, Copper hydroxide), 9, III; Marine Pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
 DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
 EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
 ENCS - Japan Existing and New Chemical Substances
 IECSC - China Inventory of Existing Chemical Substances
 KECL - Korean Existing and Evaluated Chemical Substances
 PICCS - Philippines Inventory of Chemicals and Chemical Substances
 AICS - Australian Inventory of Chemical Substances

US Federal Regulations**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	SARA 313 - Threshold Values %
Copper hydroxide - 20427-59-2	1.0
Mancozeb - 8018-01-7	1.0
Zinc oxide - 1314-13-2	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Copper hydroxide 20427-59-2	-	X	-	-
Mancozeb 8018-01-7	-	X	-	-
Zinc oxide 1314-13-2	-	X	-	-

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals

Chemical Name	California Proposition 65
Mancozeb - 8018-01-7	Carcinogen
Quartz - 14808-60-7	Carcinogen

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Copper hydroxide 20427-59-2	X	-	X
Mancozeb 8018-01-7	X	-	X
Zinc oxide 1314-13-2	X	X	X
Quartz 14808-60-7	X	X	X

U.S. EPA Label Information

EPA Pesticide Registration Number 91411-7-70051

EPA Statement

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

Difference between SDS and EPA Pesticide label

DANGER: Corrosive. Causes irreversible eye damage. Harmful if swallowed or inhaled. Do not get in eyes or clothing. Avoid inhaling dust or spray mist. Prolonged or frequently repeated dermal contact may cause allergic reactions in some individuals.

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

NFPA	Health hazards 3	Flammability 1	Instability 0	Physical and Chemical Properties -
HMIS	Health hazards 3*	Flammability 1	Physical hazards 0	Personal protection X
<i>Chronic Hazard Star Legend</i>	* = Chronic Health Hazard			

Issue Date 25-Feb-2017
 Revision Date 25-Feb-2017
 Revision Note
 No information available

Disclaimer

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

End of Safety Data Sheet