



MATERIAL SAFETY DATA SHEET

Page 1 of 7

Kocide® 101

Date Prepared: April 28, 1999

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name: Kocide® 101

HAZARD CLASSIFICATION (0-minimal, 1-slight, 2-moderate, 3-serious, 4-severe)

HMIS: HEALTH-1 FIRE-1 REACTIVITY-0

MANUFACTURER NAME AND ADDRESS

Griffin L.L.C.	Griffin (Europe) S.A.	Griffin FE (Malaysia) S/B
2509 Rocky Ford Road	c/o Minervastraat 8	P.O. Box 6506
P.O. Box 1847	B-1930 Zaventem	47300 KG Tunku
Valdosta, GA 31603-1847	Belgium	Petaling Jaya
		Malaysia

EMERGENCY TELEPHONE NUMBERS

Griffin L.L.C. (USA):	(+1) (800) 237 1854
Griffin (Europe) S.A.:	(+32)-2-720 6644
Griffin FE (Malaysia) S/B:	(+60)-3-757 4773
Prosar:	(+1) (888) 324-7598
Chemtrec:	(+1) (800) 424 9300

2. COMPOSITION/ INFORMATION ON INGREDIENTS

Component Name	% by Wt.	CAS#	ACGIH TLV	OSHA PEL
Copper Hydroxide	77.0	20427-59-2	1 mg/m ³ *	1 mg/m ³ *

* As copper dusts or mists (CAS 7440-50-8).

Components not precisely identified are proprietary or not hazardous.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Direct contact may seriously damage eye tissue. Slightly to non-toxic orally, dermally, and by inhalation. See below for route-specific details.

POTENTIAL HEALTH EFFECTS

Inhalation:	Slightly toxic by inhalation. Excessive exposure may cause cough, mucous production, shortness of breath, reflecting metal fume fever.
Eye Irritation:	Severely irritating to the eyes. Direct contact may cause destruction of eye tissue. May be corrosive to the eyes if not washed immediately.
Skin Irritation:	Slight skin irritant. Excessive exposure, especially if prolonged, may produce skin irritation. Repeated exposure may cause allergic contact dermatitis.

**Hazards Identification continued:**

POTENTIAL HEALTH EFFECTS

Skin Absorption:	Not a skin absorption hazard.
Ingestion:	Slightly toxic by oral exposure. This material may produce toxicity if ingested in large quantities. Symptoms of over-exposure may include nausea and vomiting, abdominal pain, and central nervous system depression.
Chronic:	Low chronic toxicity unless excessive exposure is encountered. Excessive exposure to copper by inhalation may result in irritation of the upper respiratory tract which, if severe, may lead to perforation of the nasal septum after long periods of exposure.

4. FIRST AID MEASURES

Inhalation:	Remove victim to fresh air. If not breathing, give artificial respiration preferably mouth-to-mouth. Get professional medical attention immediately.
Eye Contact:	Hold eyelids open and flush with water for 15-20 minutes until no evidence of chemical remains. Get professional medical attention.
Skin Contact:	Remove contaminated clothing and shoes. Wash with plenty of soap and water for 15-20 minutes until no evidence of chemical remains. Get professional medical attention.
Ingestion:	Drink promptly a large quantity of milk, egg white, gelatin solution or if these are not available, large quantities of water. Unless extensive vomiting has occurred, empty the stomach by gastric lavage with water, milk, sodium bicarbonate solution of a 0.1% solution of potassium ferrocyanide. (Gosselin, Clinical Toxicology of Commercial Products, 5th Ed.) Administration of gastric lavage should be performed by qualified medical personnel. Probable mucosal damage may contraindicate use of gastric lavage.
Emergency Medical Treatment:	Treat symptomatically. Acute oral overexposure to copper hydroxide, a major component of this product, may cause hypotension, hemolysis, and, rarely, methemoglobinemia. Severe intoxication is associated with serum copper levels greater than 500 mcg/dl.



First Aid Measures continued:

Emergency Medical Treatment: Copper hydroxide is an emetic, however, dilution with fluids, adsorption with activated charcoal, or lavage may be indicated. Chelation therapy with BAL or D-penicillamine has proved useful in cases of acute overexposure.

5. FIRE FIGHTING MEASURES

Flash Point & Method: Not determined
Flammable Limits: Not determined
Autoignition Temperature: Not determined

FIRE FIGHTING HAZARDS & PROCEDURES

General Hazard: Negligible fire hazard when exposed to heat or flame.
Extinguishing Media: Use dry chemical, carbon dioxide, water spray, or foam. No incompatible fire fighting media known.
Fire Fighting Instructions: Avoid contact with molten product to prevent serious burns.
Fire Fighting Equipment: Wear protective clothing and self-contained breathing apparatus.
Hazardous Combustion Products: Decomposes to CuO and H₂O above 140 F.

6. ACCIDENTAL RELEASE MEASURES

Land Spill: Sweep up and place in suitable (fiberboard) containers for later disposal.
Water Spill: If feasible, copper may be precipitated/ultrafiltrated with caustics or other chemicals and resulting sludge disposed of in a chemical landfill.

7. HANDLING AND STORAGE

Storage Temperature: Store below 35° C (95° F). Average shelf life under proper storage conditions is 2 years.
Storage Pressure: Ambient pressure.
General Information: Store in a clean, dry area. Do not store near feed, food or within the reach of children.



MATERIAL SAFETY DATA SHEET

Page 4 of 7

Kocide® 101

Date Prepared: April 28, 1999

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

PESTICIDE APPLICATORS & WORKERS

These workers must refer to the Product Label and Directions For Use attached to the product for Agricultural Use Requirements in accordance with the EPA Worker Protection Standard 40 CFR part 170.

MANUFACTURING, COMMERCIAL BLENDING, & PACKAGING WORKERS

Ventilation:	Control enclosed spaces with adequate ventilation to prevent exceedance of ACGIH TLV or OSHA PEL (1 mg/m ³).
Respiratory Protection:	In enclosed spaces where the TLV or PEL may be exceeded, wear NIOSH/MSHA approved dust or mist respirator.
Eye Protection:	Wear protective eyewear to prevent contact with this substance.
Protective Clothing:	Applicators and other handlers must wear long-sleeved shirt, long pants, waterproof gloves, and shoes plus socks.

9. PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure:	Negligible vapor pressure
Vapor Density (Air=1):	Not determined
Bulk Density:	102.86 - 154.29 g/m ³
Specific Gravity:	8 - 12 lb/ft ³
Solubility in Water:	Disperses to form an emulsion. Copper hydroxide is insoluble in cold water and decomposes in hot water.
pH:	8.9
Boiling Point:	Not determined
Freezing Point:	Decomposes
Viscosity:	Not determined
Odor:	Characteristic copper odor
Color:	Light blue
Physical State:	Powder

10. STABILITY AND REACTIVITY

General:	This material is stable under normal conditions.
Incompatible Materials:	Not determined
Conditions to Avoid:	Excessive heat.
Hazardous Decomposition:	Decomposes to CuO and H ₂ O above 140° F.
Hazardous Polymerization:	Material is not known to polymerize.

**11. TOXICOLOGICAL INFORMATION****ACUTE**

Inhalation: Acute inhalation LC_{50} = 11.65 mg/L (rat 1-hour). May cause irritation of the mucous membranes. Exposure to copper fume may result in metallic taste, nausea, vomiting, and metal fume fever with chills, fever, aching muscles, dry throat and headache.

Eye Irritation: Severely irritating to the eyes. May cause severe eye irritation including permanent corneal opacity. May be corrosive to the eyes if not washed immediately.

Skin Irritation: May cause slight irritation. Many copper salts cause itching, eczema and, rarely, sensitization reactions in previously exposed persons.

Skin Absorption: Acute dermal LD_{50} > 5000 mg/kg (rats). This product is slightly toxic by dermal exposure.

Ingestion: Oral LD_{50} = 833 mg/kg (rats), indicating slight toxicity. Ingestion of large doses of copper salts may result progressively in irritation of the gastrointestinal tract, nausea, vomiting, salivation, gastric pain, hemorrhagic gastritis, diarrhea, capillary damage, liver and kidney damage, and central nervous system stimulation followed by depression. Jaundice, pain in the liver, and hemolytic anemia have been reported following acute human poisonings.

CHRONIC: Repeated ingestion of copper salts may result in anemia, liver, and kidney damage. Chronic inhalation exposure may cause a metallic taste in the mouth, irritation of the upper respiratory tract such as the nasal mucosa that may progress to perforation of the nasal septum. Chronic cough may also occur. Copper hydroxide which comprises 77% of this product governs the toxicity of the product. The remaining components have low to negligible toxicity.

Special Health Effects: Copper-intolerant individuals should not be exposed to this material. No additional information is available on whether overexposure to this material would aggravate other existing special medical conditions.

Toxicity of Individual Components: This product contains 7 to 8% of an inert vehicle that, itself, contains a small fraction of crystalline silica. Although crystalline silica is associated with silicosis and lung cancer, the International Agency for Research on Cancer (IARC) has evaluated this inert vehicle and designated it as Class 3 (insufficient evidence in either animals or humans to conclude carcinogenic activity).

**12. ECOLOGICAL INFORMATION**

Chemical Fate: The degree of mobility of copper in the environment depends upon the pH of ambient soils and waters. The higher the acidity, the more soluble copper salts are and, hence, the more mobile. Partitioning of copper into air is negligible due to the low vapor pressure of copper salts.

ECOTOXICITY (copper hydroxide)

Test Type	Species	Value
Aquatic LC ₅₀	Bluegill	180,000 ppb
Aquatic LC ₅₀ (96 hr)	Fathead Minnow	23 ppb
Aquatic LC ₅₀	Rainbow Trout	23 ppb
Aquatic EC ₅₀	<i>Daphnia magna</i>	6.5 ppb
Avian - acute oral LD ₅₀	Bobwhite Quail	>340 mg/kg
Avian - 8-day dietary LD ₅₀	Bobwhite Quail	>10,000 ppm
Avian - 8-day dietary LD ₅₀	Mallard Duck	>10,000 ppm

13. DISPOSAL CONSIDERATIONS

Comply with appropriate disposal regulations. Landfill solids at permitted sites. Use registered transporters.

14. TRANSPORT INFORMATION

Department of Transportation (DOT): Not Regulated
International Air Transport Association (IATA): Not Regulated
International Maritime Organization (IMO): Not Regulated

15. REGULATORY INFORMATION

OSHA: This product is considered hazardous under the OSHA Hazardous Communication Standard 29 CFR §1910.1200.

TSCA: All product components are on the TSCA Chemical Inventory.

CERCLA: Releases of a component of this material (metallic copper, CAS No. 7440-50-8, RQ = 5000 lbs) to air, land, or water are reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to the state and local emergency planning committees under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304.



MATERIAL SAFETY DATA SHEET

Page 7 of 7

Kocide® 101

Date Prepared: April 28, 1999

Regulatory Information continued:

RCRA: When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40 CFR §261.33.

SARA TITLE III

311/312 Hazard Categories: This product has been reviewed according to the EPA "Hazard Categories" and is categorized as an acute health hazard (40 CFR §370.41).

313 Reportable Ingredients: This product contains a percentage of metallic copper (CAS No. 7440-50-8) which is listed in Section 313 above de minimis concentrations.

STATE REGULATIONS

California: Listed under copper (CAS No. 7440-50-8) with footnotes referencing above federal standards.

New Jersey: Footnotes reference above federal standards plus listing of copper on the New Jersey Environmental Hazardous Substances List (NJ Department of Environmental Protection, Title 7 New Jersey Administrative Code (NJAC) Chapter 1G).

Massachusetts: Listed as copper (CAS No. 7440-50-8) and copper-based pesticide, solid, toxic (no CAS No. assigned).

Pennsylvania: Listed as copper fume or dust (CAS No. 7440-50-8) as an environmental hazard.

16. OTHER INFORMATION

REVISION SUMMARY

This Material Safety Data Sheet replaces the one dated 02/19/96 and has been revised using the standard Griffin ANSI Z400.1 compliant format. Revisions have been made in section 1 and in word processing format.

Kocide® is a registered trademark of Griffin Corporation.

The information in this Material Safety Data Sheet relates to this specific material. It may not be valid for this material if used in combination with any other materials or in any process. It is the users' responsibility to satisfy themselves as to the suitability and completeness of this information for their own particular use.