



MATERIAL SAFETY DATA SHEET

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Pentathlon® DF

Date Prepared: August 29, 2001

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name: Pentathlon® DF

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

NFPA: HEALTH-1 FIRE-1 REACTIVITY-1

HMIS: HEALTH-2 FIRE-1 REACTIVITY-1

MANUFACTURER NAME AND ADDRESS (additional addresses found in Section 16)

Griffin L.L.C.
2509 Rocky Ford Road
P.O. Box 1847
Valdosta, GA 31603-1847

EMERGENCY TELEPHONE NUMBERS

Griffin L.L.C. (USA): (+1) (800) 237 1854

Prosar: (+1) (888) 324 7598

Chemtrec: (+1) (800) 424 9300

2. COMPOSITION/ INFORMATION ON INGREDIENTS

Component Name	% by Wt.	CAS#
Zinc ion and manganese ethylene-bisdithiocarbamate	75.0	8018-01-7
(ingredients are as follows:)		
Manganese ⁺⁺	15.0%	
Zinc ⁺⁺	1.9%	
Ethylene bisdithiocarbamate ion (C ₄ H ₆ N ₂ S ₄) ⁻⁻	58.1%	
Inert Ingredients	25.0	

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

May irritate eyes, nose, throat, and skin. May be harmful if inhaled or swallowed.

POTENTIAL HEALTH EFFECTS

Eye Irritation: Mild to moderate eye irritant. Eye contact may initially include eye irritation with discomfort, tearing, or blurring of vision.

Skin Irritation: Mild skin irritant and sensitizer. Overexposure to mancozeb by skin contact may initially include skin irritation with discomfort or rash. The compound has been infrequently associated with skin sensitization in humans. Significant skin permeation and systemic toxicity after contact appears unlikely.

Skin Absorption: Slightly toxic by contact.

3. HAZARDS IDENTIFICATION (con't)

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Ingestion: Very low toxicity by ingestion.

Based on animal studies, long-term exposure to high levels of mancozeb may cause abnormal thyroid function. Individuals with preexisting diseases of the thyroid may have increased susceptibility to the toxicity of excessive exposures.

Chronic (Mancozeb):

Inhalation: The effects in animals from repeated high doses of mancozeb (dust) equivalent to 150-250 times the AEL include reduced body weight, inflammation of the lungs, and abnormal thyroid function.

Ingestion: Toxic effects in animals from repeated ingestion of high doses include reduced body weight and thyroid effects.

Increased incidences of thyroid tumors and ocular lesions (retinopathy) were observed in rats administered 750 ppm (equivalent to approximately 35 mg/mg/day) of mancozeb in their diet for two years. This compound is considered to show weak carcinogenic activity. Tests in some animals indicate that the compound may produce embryo and fetal toxicity, but only at maternally toxic doses. Multi-generation studies in animals demonstrate no reproductive toxicity.

Although there have been isolated reports in the scientific literature of mutagenic activity of mancozeb, in general mancozeb is not genotoxic in animals or in cell cultures. Mancozeb has been tested for herbicidal gene mutation.

Ethylene thiourea (ETU), a breakdown product and minor metabolite of mancozeb, was shown to induce liver tumors in mice, but not in rats or hamsters, and caused thyroid tumors in rats. ETU is not genotoxic. ETU has been categorized as a probable human carcinogen by IARC and as a group B carcinogen by NTP. At sufficiently high doses ETU has also caused birth defects in laboratory animals.

Carcinogenicity Information:

None of the components present in this material at concentrations equal to or greater than 0.1%, are listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

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 immediately if irritation persists.

4. FIRST AID MEASURES (con't)



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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 immediately if irritation persists.

Ingestion: If victim is fully conscious, immediately give large quantities of water, but DO NOT induce vomiting. Get professional medical attention immediately. Do not give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flash Point & Method: Not determined
Flammable Limits: 0.29 g/L (%by volume in air)
Autoignition Temperature: 205° C (401° F)

FIRE FIGHTING HAZARDS & PROCEDURES

General Hazard: Like most organic powders or crystals, under severe dusting conditions, this material may form explosive mixtures in air. It may be ignited by heat or open flame.

Extinguishing Media: Use dry chemical, carbon dioxide, water spray or foam.

Fire Fighting Equipment/
Instructions:

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment. Use water spray. Runoff from fire control may be a pollution hazard. If area is heavily exposed to fire and if conditions permit, let fire burn itself out since water may increase the contamination hazard.

Hazardous Combustion
Products:

Hazardous gases/vapors produced in fire are H₂S, CS₂, and oxides of sulfur, nitrogen, and carbon.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Remove source of heat, sparks, flame, impact, friction, or electricity. Dike spill. Prevent material from entering sewers, waterways, or low areas. Shovel or sweep up. Never return to container for reuse. Scoop into bags or boxes with plastic or aluminum shovel.

7. HANDLING AND STORAGE

General Information: Avoid breathing vapors or mist. Avoid breathing dust. Avoid contact with eyes, skin, or clothing. Do not store or consume food, drink, or tobacco in areas where they may become contaminated with this material.

7. HANDLING AND STORAGE (con't)



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Handling:	Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. 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. Avoid dust regeneration.
Storage:	Store in a well-ventilated place. Keep container tightly closed. Do not store or consume food, drink, or tobacco in areas where they may become contaminated with this material. Never allow the product to become wet during storage. This may lead to chemical changes, which will reduce the effectiveness as a fungicide and create flammable vapors.

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:	Provide local exhaust ventilation and/or general dilution ventilation to meet published exposure limits.
Respiratory Protection:	Wear dual cartridge respirator for dusts and mists.
Eye Protection:	Wear protective eyewear to prevent contact with this substance.
Protective Clothing:	Mixers and loaders must wear coveralls over long-sleeved shirt and long pants, shoes plus socks, protective eyewear, and chemical-resistant apron. Applicators and other handlers must wear coveralls over long-sleeved shirt and long pants, waterproof gloves, and shoes plus socks. Personnel re-entering treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, must wear coveralls over long-sleeved shirt and long pants, waterproof gloves, and shoes plus socks. Any clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate must be discarded. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

9. PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure:	Not determined
Bulk Density (loose):	40-45 lb/cu ft



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Solubility in Water:	Dispersible
Odor:	Sulfurous
Color:	Yellow
Physical State:	Solid

10. STABILITY AND REACTIVITY

General:	This material is stable under normal conditions.
Incompatible Materials:	Acids and moisture (in storage)
Hazardous Decomposition:	Decomposes with heat. Hazardous gases / vapors produced are hydrogen sulfide, carbon disulfide, and oxides of carbon, nitrogen, and sulfur. Elevated temperature or free water promotes decomposition, which may cause spontaneous combustion.
Hazardous Polymerization:	Material is not known to polymerize.

11. TOXICOLOGICAL INFORMATION

ACUTE

Inhalation:	Not determined
Eye Irritation:	Mild to moderate eye irritant
Skin Irritation:	A mild skin irritant and sensitizer.
Skin Absorption:	Acute dermal LD ₅₀ > 2,000 mg/kg (rats)
Ingestion:	Oral LD ₅₀ > 5000 mg/kg (rats)

12. ECOLOGICAL INFORMATION

This material is toxic to fish: LC₅₀ (bluegill sunfish @ 96-h) = 1 ppm
Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Cover or incorporate spilled treated seed. Do not contaminate water by disposing of equipment washwaters.

13. DISPOSAL CONSIDERATIONS

Product Disposal:	Do not contaminate water, food, or feed by disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.
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13. DISPOSAL CONSIDERATIONS (con't)

Container Disposal:	Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by
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incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

14. TRANSPORT INFORMATION

Department of Transportation (DOT):
Not Regulated (non-bulk)
MARINE POLLUTANT (bulk) and Environmentally Hazardous Substance (bulk)
RQ for ethylenebisdithiocarbamic acid, manganese salt (maneb) = 5000 lbs (2270 kg)

International Air Transport Association (IATA):
Not Regulated (non-bulk)

International Maritime Organization (IMO):
Proper Shipping Name: Environmentally Hazardous Substance, Solid, N.O.S. (Mancozeb 75%)

Class: 9

Identification Number: UN 3077

Packing Group: III

RQ: 5000 lbs (2270 kg)

Special Notes: MARINE POLLUTANT
"RQ" must be added to proper shipping name for bulk shipments of 5000 lbs or more mancozeb per package.

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 this material to air, land, or water are not 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.

RCRA: Wastes of this commercial chemical product are classified as hazardous by 40 CFR §261.33 being a listed waste U114.

15. REGULATORY INFORMATION (con't)

SARA TITLE III
311/312 Hazard Categories: This product has been reviewed according to the EPA "Hazard Categories" relating to SARA Title III, and is



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categorized as an acute, chronic, and reactive health hazard (40 CFR §370.41)

313 Reportable Ingredients: This product does not contain a chemical listed in Section 313 of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR §372.

EPA REGISTRATION NUMBER:1812-414

STATE REGULATIONS:

California: This product contains Maneb and ethylene thiourea (ETU), chemicals known to the State of California to cause cancer in laboratory animals. ETU is also known to the State of California to cause birth defects or other reproductive harm in laboratory animals (CALIFORNIA PROPOSITION 65).

16. OTHER INFORMATION

GRIFFIN L.L.C. ADDRESSES:

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REVISION SUMMARY

This Material Safety Data Sheet has been updated using the standard Griffin ANSI Z400.1 compliant format and replaces the one dated 11/02/00. Changes have been made in Sections 1, 14, and 16.

Pentathlon® is a registered trademark of Griffin Corporation.

16. OTHER INFORMATION (con't)

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



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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.