1. PRODUCT AND COMPANY IDENTIFICATION

UPI
630 Freedom Business Center
Suite 402
King of Prussia, PA 19406

Company Information
Phone Number
Available Hrs
Customer Service
1-800-438-6071
8:00 am to 5:00 pm EST
R&D Technical Service
610-878-6100
8:00 am - 5:00 pm (EST)

Product Name
Manzate Pro-Stick T&O Fungicide
EPA Reg #
70506-234
Recommended Use
fungicide
Product Code
12-371F

Issued Date: 20-Dec-2010
Revision Date:
Revision Number: 0

Material Safety Data Sheet
United Phosphorus, Inc.

1 1

NFPA
PPE

UP1
630 Freedom Business Center
Suite 402
King of Prussia, PA 19406

Company Information
Contact Information
Phone Number
Available Hrs
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 673-6671 (24hrs)

Product Name
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EPA Reg #
70506-234
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Material Safety Data Sheet
United Phosphorus, Inc.
2. HAZARDS IDENTIFICATION

Emergency Overview
May cause allergic skin reaction
Harmful by inhalation, in contact with skin and if swallowed
May cause thyroid damage after repeated exposure based on animal data.

CAUTION

Potential Health Effects
- Inhalation
- Skin contact
- Repeated or long-term exposure may cause adverse effects on the thyroid.

<table>
<thead>
<tr>
<th>Eyes</th>
<th>May cause slight irritation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>May cause irritation of respiratory tract.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>May be harmful if swallowed.</td>
</tr>
</tbody>
</table>

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredients Name</th>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mancozeb</td>
<td>8018-01-7</td>
<td>75</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Ethylene thiourea</td>
<td>96-45-7</td>
<td>0-0.1</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact
Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Skin Contact
Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call poison control center or doctor for treatment advice.

Inhalation
Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration. Call a poison control center or doctor for further treatment advice.

Ingestion
Call a physician or Poison Control Center immediately Have person sip a glass of water if able to swallow Do not induce vomiting unless told to do so by a poison control center or doctor Never give anything by mouth to an unconscious person

Notes to Physician
No information available
5. FIRE-FIGHTING MEASURES

Flammable Explosive Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>205°C / 401°F</td>
</tr>
</tbody>
</table>

Flammability Limits in Air 0.29 g/L (% by volume in air)

Extinguishing Media
Use: Carbon dioxide (CO2) Foam Dry chemical. If stored material becomes wetted or damp it can produce heat and deteriorate, over time, to become a fire hazard.

Fire/Explosion Hazard
Firefighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear and self-contained breathing apparatus. Fire fighting equipment should be thoroughly decontaminated after use.

Hazardous Combustion Products
Carbon disulfide, ethylene thiourea (ETU), Sulfur oxides, Oxides of nitrogen, Oxides of carbon.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Avoid contact with skin, eyes and clothing. Use personal protective equipment.

Environmental Precautions
Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits. Do not flush into surface water or sanitary sewer system.

Methods for Clean-up
Sweep up and shovel into suitable containers for disposal.

7. HANDLING AND STORAGE

Handling
Avoid breathing dust. Keep out of reach of children. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Keep away from heat, sparks and open flame. - No smoking.

Storage
Store in an area where cross-contamination with pesticides, fertilizers, food or feed could not occur. If allowed to become wet the product will deteriorate and represent a fire hazard.
8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Engineering Controls
Investigate engineering techniques to reduce exposures. Local mechanical exhaust ventilation is preferred. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

PESTICIDE APPLICATORS & WORKERS. THESE WORKERS MUST REFER TO PRODUCT LABELING AND DIRECTIONS FOR USE IN ACCORDANCE WITH EPA WORKER PROTECTION STANDARD 40 CFR PART 170..

Personal Protective Equipment

Eye/face Protection
Avoid contact with eyes. Goggles.

Skin Protection
Rubber gloves. Wear protective gloves/clothing.

Respiratory Protection
Where airborne exposure is likely, use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical goggles. If exposures cannot be kept at a minimum with engineering controls, consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure, use an approved full face positive-pressure, self-contained breathing apparatus. Respiratory protection programs must comply with 29 CFR 1910.134.

General Hygiene Considerations
Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Yellow</td>
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<tr>
<td>Physical State</td>
<td>Solid</td>
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<tr>
<td>Boiling Point/Range</td>
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</tr>
<tr>
<td>Specific Gravity</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
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</tr>
<tr>
<td>Bulk Density</td>
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</tr>
<tr>
<td>Percent Volatiles</td>
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</tr>
<tr>
<td>Odor</td>
<td>Slight Rotten egg-like</td>
</tr>
<tr>
<td>pH</td>
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</tr>
<tr>
<td>Melting Point/Range</td>
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<tr>
<td>Solubility</td>
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</tr>
<tr>
<td>Vapor Pressure</td>
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</tr>
<tr>
<td>VOC Content</td>
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</tr>
<tr>
<td>Molecular Weight</td>
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</tr>
<tr>
<td>Percent Solids</td>
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</tr>
<tr>
<td>Specific Gravity</td>
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</tr>
<tr>
<td>Evaporation Rate</td>
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<tr>
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<td>40-45 lb/cu ft</td>
</tr>
<tr>
<td>Percent Volatiles</td>
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</tr>
<tr>
<td>Viscometry</td>
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</tr>
<tr>
<td>Molecular Weight</td>
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</tr>
<tr>
<td>Odor</td>
<td>Slight Rotten egg-like</td>
</tr>
<tr>
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<tr>
<td>Percent Solids</td>
<td>Not available</td>
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<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>Not available</td>
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<tr>
<td>Specific Gravity</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not available</td>
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<tr>
<td>Viscosity</td>
<td>Not available</td>
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<tr>
<td>Bulk Density</td>
<td>40-45 lb/cu ft</td>
</tr>
<tr>
<td>Percent Volatiles</td>
<td>Not available</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions

Conditions to Avoid
To avoid thermal decomposition, do not overheat. Keep away from children.

Incompatible Materials
Strong oxidizing agents. Acids.

Hazardous Decomposition Products
carbon disulfide, ethylene thiourea. Hydrogen sulfide.

Possibility of Hazardous Polymerization
Hazardous polymerisation does not occur
11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information

Manzate Pro Stick:
- Oral LD50 (rat) = >5,000 mg/kg
- Dermal LD50 (rabbit) = > 2,000 mg/kg
- Inhalation LC50 (rat) 4 hr = >5.4 mg/L

Mild to moderate eye irritant. Mild to slight skin irritant. Sensitizer.

Chronic Toxicity

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

 Toxic effects in animals from repeated ingestion of high doses of Mancozeb include reduced body weight and thyroid effects. In a different study, repeated dosing caused toxic and neuopathological effects in male and female rats which included compound-related mortality, decreased body weight, impaired hind limb motor activity and histopathological evidence of nerve damage. The no-observable effect level was 125 ppm.

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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene thiourea</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IARC: (International Agency for Research on Cancer)
A trace contaminant, Ethylene thiourea (ETU) a breakdown product of Maneb, has been categorized as a probable human carcinogen by NTP.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Mancozeb:
- Aquatic toxicity:
  - 96 hour LC50 = rainbow trout 0.73 mg/L
  - 96 hour LC50 = fathead minnows 0.57 mg/L
  - 96 hour LC50 = Bluegill sunfish 0.84 mg/L

  72 hour EC50 = freshwater algae = 0.43 mg/L.
13. DISPOSAL CONSIDERATIONS

Waste Disposal Method
Dispose of in accordance with local regulations. Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide or rinseate is a violation of Federal law. If the wastes cannot be disposed of by use or 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.

Contaminated Packaging
Refer to product label.

14. TRANSPORT INFORMATION

DOT
Not regulated when shipped by highway in non-buk containers as per 49 CFR 171.4
When shipped in bulk, by vessel, or internationally use the following shipping description:

Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s. (Mancozeb)
Hazard Class: 9
UN-No: UN3077
Packing Group: PG III
Marine Pollutant: Yes.

ICAO
UN-No: UN3077
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Mancozeb)
Hazard Class: 9
Packing Group: PG III

IATA
UN-No: 3077
Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s. (Mancozeb)
Hazard Class: 9
Packing Group: PG III

IMDG/IMO
Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s. (Mancozeb)
Hazard Class: 9
UN-No: 3077
Packing Group: PG III
Marine Pollutant: This product contains a chemical which is listed as a marine pollutant according to IMDG/IMO

15. REGULATORY INFORMATION

International Inventories
Mancozeb
ENCS: Listed
CHINA: Listed
KECL: Listed
Mancozeb
Ethylene thiourea

### Chemical Name	CAS-No	Weight %
Mancozeb	8018-01-7	75
Ethylene thiourea	96-45-7	0-0.1

### SARA 311/312 Hazardous Categorization

- **Chronic Health Hazard**: Yes
- **Acute Health Hazard**: Yes
- **Fire Hazard**: No
- **Sudden Release of Pressure Hazard**: No
- **Reactive Hazard**: No

### Clean Water Act

### Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product contains the following HAPs:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>HAPS data</th>
<th>VOC Chemicals</th>
<th>Class 1 Ozone Depletors</th>
<th>Class 2 Ozone Depletors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mancozeb</td>
<td>8018-01-7</td>
<td>75</td>
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<tr>
<td>Ethylene thiourea</td>
<td>96-45-7</td>
<td>0-0.1</td>
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</tr>
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</table>

### CERCLA

<table>
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<th>Chemical Name</th>
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<tbody>
<tr>
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<tr>
<td>Ethylene thiourea</td>
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</tbody>
</table>

### RCRA

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>RCRA - D Series Wastes</th>
<th>RCRA - P Series Wastes</th>
<th>RCRA - U Series Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene thiourea</td>
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<td>U116</td>
</tr>
</tbody>
</table>

### Pesticide Information

### State Regulations

#### California Proposition 65
This product contains the following Proposition 65 chemicals:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Category</th>
<th>California Prop. 65</th>
</tr>
</thead>
</table>

---

Page 7 / 9
### Chemical Name

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Category</th>
<th>California Prop. 65</th>
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<tbody>
<tr>
<td>Mancozeb</td>
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<td></td>
<td></td>
<td></td>
<td>Listed: January 1, 1988</td>
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<td></td>
<td></td>
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<td>Listed: January 1, 1993</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Developmental toxin.</td>
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<tr>
<td></td>
<td></td>
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<td>20 ug/day</td>
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</table>

### State Right-to-Know

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
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</thead>
<tbody>
<tr>
<td>Mancozeb</td>
<td></td>
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<td></td>
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</tr>
<tr>
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</tr>
<tr>
<td></td>
<td></td>
<td>Substance no. 2371</td>
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</tr>
<tr>
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<td></td>
<td>Substance no. 2372</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Substance no. 2324</td>
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<td>Substance no. 0883</td>
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<td></td>
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<td>Special hazard.</td>
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</tbody>
</table>

### International Regulations

**Mexico - Grade**

Not available

**Canada**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS Hazard Class**

Not determined

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>NPRI</th>
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<tbody>
<tr>
<td>Mancozeb</td>
<td>X</td>
</tr>
<tr>
<td>Ethylene thiourea</td>
<td>X</td>
</tr>
</tbody>
</table>

### 16. OTHER INFORMATION

**Revision Date**

**Revision Summary**

Add to system
UPI, Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with other materials or in any process. Further, since the conditions and methods of use are beyond the control of UPI, Inc. UPI, Inc. expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.

End of MSDS