Taminco, Inc.

MATERIAL SAFETY DATA SHEET

SECTION 1 IDENTIFICATION

Product Name: Flowsan™
(syn: Tetramethylthiuram Disulfide, Thiram, TMTD, Bis [Dimethylthiocarbamyl] Disulfide)

Product Use: Reduce seedling losses from seed decay, damping off and seedling blights

Company: Taminco, Inc.
1303 Boyd Avenue, N.W.
Atlanta, Georgia 30318

For Emergencies Involving a Spill, Leak, Fire, Exposure or Accident Contact CHEMTREC (800) 424-9300
For Product Information: (404) 351-3340

EPA Reg. No.: 45728-28

SECTION 2: HAZARDS IDENTIFICATION

Red, liquid with no odor

EMERGENCY OVERVIEW:

CAUTION!
Harmful if swallowed.
Causes moderate eye irritation.
Very toxic to aquatic organisms.

Avoid contact with the skin, eyes or clothing. Avoid breathing spray mist. Do not take alcohol immediately before or after exposure to this product. The consumption of alcohol by the applicator can increase the toxicity of the product. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

SECTION 3 PRODUCT COMPONENTS

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>CAS NO.</th>
<th>WT.%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetramethylthiuram disulfide</td>
<td>137-26-8</td>
<td>42.64</td>
</tr>
<tr>
<td>(active ingredient)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Ingredients</td>
<td>Proprietary</td>
<td>57.36</td>
</tr>
</tbody>
</table>

SECTION 4 EMERGENCY and FIRST AID PROCEDURES

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

INGESTION: Call a poison control center or doctor immediately for treatment advice. If conscious, have the 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. Do not give anything by mouth to an unconscious person.

SKIN CONTACT: Take off contaminated clothing. 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 person 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.

NOTE: Tetramethylthiuram Disulfide is the methyl analog of antabuse. Consumption of small amounts of alcohol and acute or chronic tetramethylthiuram disulfide exposure will cause similar effects as antabuse. These include palpitations, nausea, vomiting, headaches, shortness of breath.

SECTION 5 FIRE and EXPLOSION HAZARD DATA
EXTINGUISHING MEDIA: Not defined as flammable or combustible. Product may support combustion under fire condition. Use carbon dioxide, dry chemicals, foam, water or water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate area of all non emergency personnel. Firefighters should wear full emergency equipment and NIOSH approved positive pressure self-contained breathing apparatus. Fight fire from upwind and cool exposed intact containers and structures with water spray or stream at maximum range. Decontaminate all protective equipment after use, prevent skin contact. This product is toxic to fish. Contain all water run-off with diking.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Decomposition products are toxic. Very high concentrations of this product suspended in air may present an explosion hazard.

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>CAS NO.</th>
<th>EXPOSURE LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetramethylthiuram disulfide (active ingredient)</td>
<td>137-26-8</td>
<td>5 mg/m3 TWA-PEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 mg/m3 TWA-TLV</td>
</tr>
<tr>
<td>Other Ingredients</td>
<td>Proprietary</td>
<td>None Established</td>
</tr>
</tbody>
</table>

SECTION 6 ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Wear appropriate protective clothing as described in Section 8 to prevent eye and skin contact and appropriate respirator to prevent overexposure. Isolate area and keep out unprotected persons. Stop leak at source. Absorb spills onto clay, sand or vermiculite and place into labeled containers for proper disposal. This material is toxic to fish. Prevent run-off to storm sewers and ditches leading to natural waterways. Report spill as required by local and federal regulations.

SECTION 7 HANDLING and STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING and STORING: Protect containers from physical damage. Protect from excessive heat. Keep from freezing. Store in original container only in a secured area inaccessible to children and unauthorized persons. Do not store near food or feed. Do not contaminate water, food or feed by storage, disposal or cleaning of equipment. Do not get in eyes, on skin or on clothing. Avoid inhaling spray mists. Use only with adequate ventilation and appropriate protective equipment. Carefully open containers. Stir before use. Immediately remove and launder contaminated clothing before re-use. Wash hands before eating, drinking, chewing gum, using tobacco products or using toilet facilities. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove personal protective equipment (PPE) immediately after handling product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Do not apply this product in such a manner as to directly or thorough drift expose workers or other persons. Only protected handlers may be in the area during application. For any requirements specific to your state, province or Tribe, consult the agency responsible for pesticide regulation. Use this product only in accordance with its labeling and the Worker Protection Standard, 40CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24 hours. PPE required for early entry to treated areas that is permitted under the Worker Protection Standard is described in Section 8 of this MSDS. Exception: Once treated seed, seed pieces or bulbs are planted in soil or other planting media, the Worker Protection Standard allows workers to enter the treated area without restriction, if there will be no contact with the treated seeds, seed pieces or bulbs.

OTHER PRECAUTIONS: Keep containers tightly closed. Empty containers retain product residues and are hazardous. Follow all MSDS precautions in handling empty containers. This product is toxic to fish, aquatic invertebrates, birds, mammals, oysters and shrimp. Do not apply directly to water or areas where surface water is present to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposing of equipment washwaters. Drift or runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not plant treated seeds, or seed pieces by broadcasting to the soil surface. Ensure that all seeds, seed pieces, or bulbs are thoroughly covered with soil, especially in turn areas. If seeds, seed pieces, or bulbs are not thoroughly incorporated by the planter during planting, additional incorporation may be required to thoroughly cover the exposed seeds, seed pieces or bulbs. Apply this product only as specified on the product label.

SECTION 8 EXPOSURE CONTROLS and PERSONAL PROTECTION
RESPIRATORY PROTECTION: All mixers, loaders, applicators and other handlers must use a properly fit-tested NIOSH approved respirator with an organic vapor-cartridge or canister with any N, R, P, or HE prefilter. Selection of respiratory protection depends on the contaminant type, form and concentration. Select in accordance with OSHA 1910.134 and good Industrial Hygiene practice.

ENGINEERING CONTROLS: When handlers use closed systems in a manner that meets the requirements listed in the Worker Protection Standard for agricultural pesticides [40CFR 170.240(d)], the handler PPE requirements may be reduced or modified as specified in the Worker Protection Standard.

PROTECTIVE CLOTHING: Mixers, loaders applicators and other handlers must wear long sleeved shirt and long pants, chemical resistant gloves such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, polychloride (PVC) ≥ 14 mils or Viton ≥ 14 mils, protective eyewear and shoes with socks. A chemical resistant apron is required when mixing, loading, participating in dip treatments, cleaning up spills, cleaning equipment, or otherwise exposed to the concentrate.

Note: Persons involved in bagging treated seed, sewing or moving bags of treated seed, or cleaning up bagging areas or seed treatment equipment and persons involved in handling, cutting or sorting treated seed pieces are pesticide handlers and must wear the PPE required on the label for pesticide handlers.

Early entry to treated areas that is permitted under the Worker Protection Standard requires the wearing of coveralls, chemical resistant gloves (as listed above), protective eyewear and shoes plus socks.

Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove personal protective equipment (PPE) immediately after handling product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

EYE PROTECTION: Non-venting chemical safety goggles are recommended if full face-piece respirator is not worn.

OTHER PROTECTIVE EQUIPMENT: For operations where contact can occur, a safety shower and an eye wash facility should be immediately available.

Note: Follow the manufacturer’s instructions for cleaning and maintaining Personal Protective Equipment (PPE). If no specific instructions for decontamination are available, use detergent and hot water. Keep and wash (launder) PPE separately from other laundry.

SECTION 9 PHYSICAL and CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT @ 760 mmHg</td>
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</tr>
<tr>
<td>VAPOR PRESSURE @ 20 cmHg</td>
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</tr>
<tr>
<td>VOLATILE</td>
<td>Approximately 43%</td>
</tr>
<tr>
<td>EVAPORATION RATE</td>
<td>No data available</td>
</tr>
<tr>
<td>COEFFICIENT of WATER/OIL</td>
<td>1.73</td>
</tr>
<tr>
<td>FLASH POINT</td>
<td>Not combustible</td>
</tr>
<tr>
<td>FLAMMABLE LIMITS</td>
<td>Not available</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>Red liquid no odor.</td>
</tr>
<tr>
<td>FREEZING POINT @ 760 mmHg</td>
<td>Not available</td>
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<tr>
<td>SPECIFIC GRAVITY (H2O=1)</td>
<td>1.24</td>
</tr>
<tr>
<td>VAPOR DENSITY (Air=1)</td>
<td>Not available</td>
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<tr>
<td>SOLUBILITY IN WATER</td>
<td>Not available</td>
</tr>
<tr>
<td>pH</td>
<td>6.87 (1% solution)</td>
</tr>
<tr>
<td>METHOD</td>
<td>Not applicable</td>
</tr>
<tr>
<td>AUTOIGNITION TEMPERATURE</td>
<td>&gt;400°C</td>
</tr>
</tbody>
</table>

SECTION 10 STABILITY and REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: Excessive heat.
INCOMPATIBILITY: Acids, oxidizers, copper.
HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

EYE CONTACT: May cause irritation based on a study in rabbits.
SKIN CONTACT: May cause irritation and possibly sensitization. Animal studies indicate that this product is a moderate sensitizer. Limited toxicity by skin absorption based on a proprietary study Dermal LD50 (rat) - > 5 g/kg.
INHALATION: May cause mucous membrane and respiratory irritation with coughing, choking and labored breathing.
INGESTION: May cause systemic poisoning with symptoms of weakness, nausea, vomiting, diarrhea, confusion, dizziness, delirium, tremor, hallucinations, ataxia, ascending paralysis, hypothermia and peripheral neuropathy (pain, numbness and weakness of the extremities). Respiratory paralysis and death may occur.

OTHER TOXIC EFFECTS: An antabuse-like reaction with flushing, sweating, headache, weakness and hypotension may occur when ethyl alcohol (alcoholic beverages) is ingested following exposure to this material.

CARCINOGENICITY: This product is not listed as a carcinogen or suspect carcinogen by NTP, IARC or OSHA.

CHRONIC EFFECTS of OVEREXPOSURE: Thiram has been found to be mutagenic in some test systems and to cause adverse reproductive effects in laboratory animals.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with chronic respiratory and skin diseases may be at increased risk from exposure to this material.

TOXICOLOGY DATA:

<table>
<thead>
<tr>
<th>Product</th>
<th>LD50</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt;5 gm/kg oral rat *</td>
<td>No data available</td>
</tr>
</tbody>
</table>

* Taminco Proprietary Study

SECTION 12: ECOLOGICAL INFORMATION

ENVIRONMENTAL PRECAUTIONS: This product is toxic to fish, aquatic invertebrates, birds, mammals, oysters and shrimp. 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 by cleaning of equipment or disposal of equipment washwaters. Drift or runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Apply this product only as specified on this label.

Ecotoxicity Values: LC50 fish 0.046-1.2 mg/L/96 hr
EC50 daphnia 0.011 mg/L/48 hr
EC50 algae 0.24 mg/L/120 hr

SECTION 13: DISPOSAL INFORMATION

WASTE DISPOSAL METHOD: Dispose in accordance with all local, provincial and federal regulations.

Pesticide wastes are toxic. 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 Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

Triple rinse (or equivalent). The offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or by incineration or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

SECTION 14: TRANSPORTATION INFORMATION

DOT SHIPPING NAME: Environmentally Hazardous Substance, Liquid, n.o.s. (Thiram), 9, UN3082, PG III, RQ
DOT HAZARD CLASSIFICATION: Class 9 (Miscellaneous Hazardous Material)
DOT LABELS REQUIRED (49CFR 172.101): Class 9
UN NUMBER: UN3082
REPORTABLE QUANTITY: 23.4 lbs. (10.6 kg) for product

SECTION 15: REGULATORY INFORMATION

OSHA HAZARD CLASSIFICATION: Irritant, toxic, target organ effect, sensitizer
EPA SARA 311 HAZARD CLASSIFICATION: Acute health, chronic health
SARA TITLE 111 SECTION 313 INFORMATION: The following components are regulated under SARA Title 313

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS#</th>
<th>WT%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiram</td>
<td>137-26-8</td>
<td>42.64</td>
</tr>
</tbody>
</table>

CERCLA HAZARDOUS SUBSTANCE (40CFR116): Thiram
REPORTABLE QUANTITY: 10 lbs (4.54 kg). Product RQ = 23.4 lbs. (10.6 kg)
STATE R-T-K COMPOSITION INFORMATION

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS #</th>
<th>WT%</th>
<th>PA</th>
<th>MA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiram</td>
<td>137-26-8</td>
<td>42.64%</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

CALIFORNIA PROPOSITION 65 INFORMATION: This product contains no California Proposition 65 regulated chemicals.

WHMIS CLASSIFICATION: Toxic material causing other toxic effects (Class D-Subdivision 2, Subdivision B)

SECTION 16: OTHER INFORMATION

HMIS HAZARD RATINGS: Health 2 Flammability 1 Reactivity 0
0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

DISCLAIMER: The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Taminco makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards and regulations.

Approved By: [Signature]  Dated: 08/17/07
Denese A. Deeds, CIH
IH&SC, Inc.