

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: SIGNET™ 480 FS Seed Treatment
EPA Reg. No.: 45728-26-55146
Synonyms: Thiram; Tetramethylthiuram Disulfide
Product Type: Fungicide

Company Name: Nufarm Americas Inc. AGT Division
 150 Harvester Drive, Suite 200
 Burr Ridge, IL 60527

Telephone Numbers: For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,
 Call CHEMTREC Day or Night: 1-800-424-9300
 For Medical Emergencies Only, Call 1-877-325-1840

Date of Issue: February 4, 2009 **Supersedes:** February 3, 2009
Sections Revised: Section 14

2. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance and Odor: Opaque liquid suspension with no specific odor.

Warning Statements: Caution. Keep out of reach of children. Harmful if swallowed or inhaled. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Avoid breathing spray mist or vapor. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Potential Health Effects:

Likely Routes of Exposure: Inhalation, eye and skin contact.

Eye Contact: Moderately irritating based on toxicity studies.

Skin Contact: Slightly toxic and mildly irritating based on toxicity studies. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Ingestion: Harmful if swallowed. Do not take alcohol immediately before or after exposure to this product. The consumption of alcohol may increase the toxicity of the product.

Inhalation: Low inhalation toxicity. May irritate the respiratory tract.

Medical Conditions Aggravated by Exposure: Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:

This product is toxic to fish, aquatic invertebrates, birds, oysters and shrimp. Treated seeds, seed pieces and bulbs are hazardous to fish, birds and mammals. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas.

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Thiram	137-26-8	44.0
Other Ingredients		56.0

4. FIRST AID MEASURES

If Swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 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.

If on Skin: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

5. FIRE FIGHTING MEASURES

Flash Point: Not applicable due to aqueous formulation

Autoignition Temperature: Not determined

Flammability Limits: Not determined

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.

Hazardous Decomposition Materials (Under Fire Conditions): May produce oxides of carbon, hydrogen, nitrogen and sulfur.

National Fire Protection Association (NFPA) Hazard Rating:

Rating for this product: Health: 1 Flammability: 1 Reactivity: 0

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:

Avoid contact with eyes, skin or clothing. Avoid breathing spray mist or vapor. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing/Personal Protective

Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Storage:

Store in original containers only in a secured area inaccessible to children and unauthorized persons. Absorb spills onto clay, sand or vermiculite and hold for proper disposal. Protect from excessive heat. Keep from freezing. Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:

Eye/Face Protection: Not normally required. To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves, except when flagging to support aerial applications, applying with aircraft or applying while driving motorized ground equipment. Wear a chemical-resistant apron when mixing, loading, cleaning up spills, cleaning equipment or otherwise exposed to the concentrate. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Wear a properly fit-tested NIOSH approved respirator with an organic vapor (OV) cartridge or canister with an N, R or P filter.

General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
Thiram	5	NE	0.05*	NE	mg/m ³

*Inhalable fraction and vapor

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Opaque liquid suspension with no specific odor.

Boiling Point:	Not applicable	Solubility in Water:	Partially
Density:	9.6 pounds/gallon	Specific Gravity:	1.15
Evaporation Rate:	Not applicable	Vapor Density:	Not applicable
Freezing Point:	Approximately 32°F	Vapor Pressure:	Not applicable
pH:	Not determined	Viscosity:	

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Chemical Stability: This material is stable under normal handling and storage conditions.

Conditions to Avoid: Excessive heat. Do not store near heat or flame.

Incompatible Materials: Acids, oxidizing agents and copper.

Hazardous Decomposition Products: Under fire conditions may produce oxides of carbon, hydrogen, nitrogen and sulfur.

Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Data from laboratory studies on this product are summarized below:

Oral: Rat LD₅₀: 2,400 mg/kg

Dermal: Rat LD₅₀: >2,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: 4.42 mg/L

Eye Irritation: Rabbit: Moderately irritating

Skin Irritation: Rabbit: Mildly irritating

Skin Sensitization: Guinea Pigs: Sensitizing

Subchronic (Target Organ) Effects: Thiram is a central nervous system depressant. Repeated overexposure to thiram may cause effects to liver, blood and urinary system.

Carcinogenicity / Chronic Health Effects: Prolonged overexposure to thiram may cause effects to liver, kidneys and blood. Thiram did not cause cancer in laboratory animal studies.

Reproductive Toxicity: Thiram was not a reproductive toxicant in multi-generation reproduction studies in rats.

Developmental Toxicity: Animal studies on thiram resulted in severe fetal malformations including central nervous system defects as well as protruding tongue and cleft palates at dose levels which did not cause maternal toxicity.

Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that thiram is not mutagenic.

Other Effects: Thiram caused neurotoxic effects (eg lethargy, reduced activity) in laboratory animals.

Assessment Carcinogenicity: None listed with ACGIH, IARC, NTP or OSHA.

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Thiram Technical:

96-hour LC ₅₀ Bluegill:	42 ppb	Bobwhite Quail 8-day Dietary LC ₅₀ :	3,950 ppm
96-hour LC ₅₀ Rainbow Trout:	130 ppb	Mallard Duck Oral LD ₅₀ :	>2,800 mg/kg
48-hour EC ₅₀ Daphnia:	3.6 ppb	Mallard Duck 8-day Dietary LC ₅₀ :	5,000 ppm
48-hour Honey Bee:	74 µg/bee		

Environmental Fate:

Thiram is nearly immobile in clay soils or in soils high in organic matter. It is slightly soluble in water and has a strong tendency to adsorb to soil particles. The soil half-life of thiram is about 15 days. Thiram degrades more rapidly in acidic soils and in soils high in organic matter. In water, thiram is rapidly broken down by hydrolysis and photodegradation, especially under acidic conditions. Thiram may adsorb to suspended particles or to sediment.

13. DISPOSAL CONSIDERATIONS**Waste Disposal Method:**

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 the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Offer for recycling, if available.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT**< 2 gallons per completed package**

Non Regulated – See 49 CFR 173.132(b)(3), & 171.4(c)

≥ 2 and < 119 gallons per completed package

RQ, UN 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, NOS, (THIRAM), 9, III

≥ 119 gallons per completed package

RQ UN 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, NOS, (THIRAM), 9, III,
MARINE POLLUTANT

IMDG

UN 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, NOS, (THIRAM), 9, III,
MARINE POLLUTANT

IATA

Non Regulated - See IATA 3.6.1.5.3

15. REGULATORY INFORMATION**U.S. Federal Regulations:**

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:**Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):**

Immediate and Delayed

Section 313 Toxic Chemical(s):

Thiram (CAS No. 137-26-8) 44% by weight in product

Reportable Quantity (RQ) under U.S. CERCLA:

Thiram (CAS No. 137-26-8) 10 pounds

RCRA Waste Code:

Thiram (CAS No. 137-26-8) U244

State Information:

Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not Listed**16. OTHER INFORMATION**

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

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