



Material Safety Data Sheet

Defiant® Turf Fungicide and Animal Repellant

Revision Date 10-Feb-2013

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product Name Defiant® Turf Fungicide and Animal Repellant

Use of the Substance/Preparation fungicide

EPA Reg No 45728-21

Company/Undertaking Identification **Taminco US Inc.**
Two Windsor Plaza, Suite 411
7540 Windsor Drive
Allentown, PA 18195
(800) 223-3258

Emergency telephone number In case of emergency call CHEMTREC 1-800-424-9300
703-527-3887 (International Calls)

2. HAZARDS IDENTIFICATION

Appearance Light brown granules, characteristic

Emergency Overview

- WARNING!
- Causes eye irritation
- May be harmful by inhalation, ingestion, skin adsorption
- May cause irritation of respiratory tract
- May cause skin irritation and/or dermatitis
- May cause allergic skin reaction
- May cause damage to organs through prolonged or repeated exposure

Principal Routes of Exposure

- Eye contact
- Skin contact
- Inhalation

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %
Thiram	137-26-8	75

4. FIRST AID MEASURES

Ingestion

- Call a physician or Poison Control Centre immediately
- Rinse mouth
- Do not induce vomiting without medical advice
- Never give anything by mouth to an unconscious person
- Take the container, label, or product name and Pest Control Registration Number with you when seeking medical attention.

Skin Contact

- Immediately flush skin with running water for 20 minutes or until no traces remain. Wash with soap and water. Remove contaminated clothing immediately.
- Call a physician or Poison Control Centre immediately

Eye Contact

- Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 20 minutes.
- Call a physician or Poison Control Centre immediately

Inhalation

- Move to fresh air
- If not breathing, give artificial respiration
- If breathing is difficult, give oxygen
- Call a physician or Poison Control Centre immediately

Notes to Physician

- Use of alcoholic beverages may enhance toxic effects

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

- water spray
- carbon dioxide (CO₂)
- dry chemical
- foam

Specific methods

- Evacuate area and fight fire from a safe distance
- Keep containers and surroundings cool with water spray
- Wash/Decontaminate removed clothing before reuse
- Dike and collect water used to fight fire
- Water runoff can cause environmental damage
- Do not flush into surface water or sanitary sewer system

Special protective equipment for fire-fighters

- Firefighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent)

Specific hazards

- Heating or fire can release toxic gas
- Dust can form an explosive mixture in air
- Toxic to fish
- Toxic to wildlife and domestic animals

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

- Wear suitable protective equipment
- Evacuate personnel to safe areas
- Prevent further leakage or spillage if safe to do so

Environmental Precautions

- Prevent product from entering drains
- Do not flush into surface water or sanitary sewer system
- Report spills as required by local and federal regulations.
- Toxic to fish
- Toxic to wildlife and domestic animals
- Read the product label for additional information.

Methods for Clean-up

- Prevent further leakage or spillage if safe to do so
- Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13)
- Read the product label for additional information.

7. HANDLING AND STORAGE

Storage

Technical measures/Precautions

- Protect containers from physical damage
- Keep containers tightly closed in a dry, cool and well-ventilated place
- Store in original container
- Keep away from heat
- Keep away from food, drink and animal feedingstuffs
- Do not use on, in or around the home
- Keep away from children
- Do not re-use empty containers
- Observe label precautions

Incompatible products

- acids
- Oxidizing agents
- copper

Handling

Technical measures/Precautions

- Wear personal protective equipment
- Ensure that eyewash stations and safety showers are close to the workstation location
- Handle in accordance with good industrial hygiene and safety practice
- When using, do not eat, drink or smoke
- It is a violation of Federal Law to use this product in a manner that is inconsistent with its labeling.
- Toxic to fish
- Toxic to wildlife and domestic animals

Safe handling advice

- Avoid contact with skin, eyes and clothing
- Do not breathe dust
- Use only in well-ventilated areas
- Wear personal protective equipment
- Remove and wash contaminated clothing before re-use
- Wash hands and face before breaks and immediately after handling the product
- Re-open used containers with caution
- Empty containers retain product residue and may be hazardous
- Use this product only in accordance with its labeling and the Worker Protection Standard, 40 CFR 170. It contains requirements for training, decontamination, notification and emergency assistance.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL
Thiram	TWA: 0.05 mg/m ³ Inhalable fraction and vapor.	PEL: 5 mg/m ³

Respiratory Protection

- In the case of dust or aerosol formation use respirator with an approved filter
- The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace
- Handle in accordance with good industrial hygiene and safety practice
- For additional information on the use and care of respiratory protection see product label.

Engineering measures

- Ensure adequate ventilation, especially in confined areas
- For additional information on ventilation requirements see product label or consult the Worker Protection Standard for agricultural pesticides (40 CFR 170.240(d)).

Personal Protective Equipment**Eye Protection**

- Tightly fitting safety goggles

Hand protection

- Rubber gloves
- Impervious gloves
- Request information on glove permeation properties from the glove supplier

Skin Protection

- Wear suitable protective equipment
- Choose body protection according to the amount and concentration of the dangerous substance at the work place
- For information on the use and care of personal protective equipment see product label.

Other protective equipment

- Ensure that eyewash stations and safety showers are close to the workstation location

Environmental exposure controls

- Prevent product from entering drains
- Do not contaminate surface water
- Avoid subsoil penetration
- Observe label precautions

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Physical State	Solid
Color	Light brown
Odor	characteristic

Important Health Safety and Environmental Information

Boiling Point/Range Not applicable

Flash Point Not available

Viscosity Not applicable

Vapor Pressure	No data available
Partition Coefficient (n-octanol/water)	log Pow 1.73
pH	8.9 (4% solution)
Water solubility	dispersible
Oxidizing Properties	Not applicable
Evaporation Rate	Not applicable
Explosion Limits	
Explosive Properties	Not explosive
Melting Point/Range	Not applicable
Density	~ 0.60 g/mL
Autoignition Temperature	235°C

10. STABILITY AND REACTIVITY

Stability	<ul style="list-style-type: none"> Stable
Conditions to Avoid	<ul style="list-style-type: none"> Avoid dust formation Keep away from heat Strong acids and oxidizing agents copper
Hazardous Decomposition Products	<ul style="list-style-type: none"> nitrogen oxides (NO_x) Carbon oxides sulphur oxides hydrogen sulfide Carbon disulfide
Hazardous Polymerization	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Eye Contact	Contact with eyes may cause irritation.
Skin Contact	May cause skin irritation and/or dermatitis. May cause sensitization by skin contact. Can be absorbed through skin.
Inhalation	May cause irritation of respiratory tract. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.
Ingestion	Ingestion may provoke the following symptoms: nausea, Vomiting, Dizziness, pain, weakness, tremors, numbness, central nervous system depression, Neurological disorders.
Chronic Effects	May cause damage to organs through prolonged or repeated exposure. Liver. Kidney. Blood. Stomach/intestinal disorders. Chronic exposure may cause dermatitis. Use of alcoholic beverages may enhance toxic effects.
Carcinogenicity	The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	IARC	ACGIH	OSHA	NTP
Thiram	X			

Aggravated Medical Conditions Respiratory disorders. Skin disorders. Liver disorders. Kidney disorders.

Product Information

LD50/oral/rat =	1407 mg/kg
LD50/dermal/rabbit =	> 2000 mg/kg
LC50 Inhalation	It was demonstrated that during intended and foreseen applications, no respirable aerosol is formed
Eye irritation	No eye irritation
Skin irritation	Non-irritating to the skin
Sensitization	Causes sensitization
Target Organ Effects	Kidney, Liver
Mutagenic Effects	Did not show mutagenic effects in animal experiments
Reproductive toxicity	No toxicity to reproduction
Carcinogenic effects	Did not show carcinogenic effects in animal experiments

12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxicity to fish	LC50 : 0.046 - 1.20 mg/L
EC50/48h/daphnia =	> 0.2 mg/l
EC50/120h/algae =	0.14 mg/l
Toxicity to bacteria	IC50 : 3.11 mg/l

Mobility

Koc = 2245-24526

Persistence and Degradability

Degradation half life
after 2-7 days

Bioaccumulative Potential

minimum

13. DISPOSAL CONSIDERATIONS

Waste disposal methods	Dispose of in accordance with local regulations
Contaminated Packaging	Empty containers should be taken for local recycling, recovery or waste disposal. Do not re-use empty containers.

14. TRANSPORT INFORMATION

DOT

51031E - Defiant® Turf Fungicide and Animal Repellant

Proper Shipping Name UN3077, Environmentally Hazardous Substance, Solid, N.O.S. (Thiram), 9, PG III, RQ
Hazard Class 9
UN-No UN3077
Packing Group PGIII
Reportable Quantity (RQ) 13.3 lbs. (6 kg.)
Marine Pollutant Yes.
Labelling Class 9

IMDG/IMO

Proper Shipping Name UN3077, Environmentally Hazardous Substance, Solid, N.O.S. (Thiram), 9, PG III, RQ, Marine pollutant
Hazard Class 9
UN-No UN3077
Packing Group PGIII
Marine Pollutant Yes
Labelling Class 9

IATA

UN-No UN3077
Proper Shipping Name UN3077, Environmentally Hazardous Substance, Solid, N.O.S. (Thiram), 9, PG III, RQ
Hazard Class 9
Packing Group PGIII
Labelling Class 9

15. REGULATORY INFORMATION

International Inventories

All of the components in the product are on the following inventory lists: All of the components in the product are on the following inventory lists: U.S.A. (TSCA), Europe (EINECS/ELINCS/NLP), Canada (DSL/NDL), Japan (ENCS), Japan Bioaccum (MITI), Australia (AICS), Philippines (PICCS), China (IECSC), Korea (KECL), New Zealand (NZIoC).

NOTE: X = Listed

Chemical Name	TSCA	EINECS	DSL	ENCS	MITI	AICS	PICCS	IECSC	KECL	NZIoC
Thiram	X	205-286-2	X	X	(2)-1820	X	X	X	97-1-315 KE-33632	X

OSHA HAZARD CLASSIFICATION: Irritant, Sensitizer, Target Organ Effects

SARA 311/312 Hazardous Categorization

Acute Health Hazard, Chronic Health Hazard

SARA TITLE III SECTION 313 INFORMATION:

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

NOTE: X = Listed

Chemical Name	de minimus %
Thiram 137-26-8	X

CERCLA Hazardous Substances

This product has the following CERCLA/SARA TPQ and RQ:

Chemical Name	TPQ	RQ
Thiram 137-26-8		10 lbs (4.54 kg).

State Right-to-Know

NOTE: X = Listed

Chemical Name	PA	NJ	MA
Thiram 137-26-8	X	X	X

California Proposition 65

This product does not contain any Proposition 65 chemicals.

WHMIS Hazard Class

D2B Toxic materials

Canadian Environmental Protection Act

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR

16. OTHER INFORMATION

HMIS	Health 2	Flammability 1	Physical Hazard 0
NFPA	Health 2	Fire 1	Instability 0

Legend: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Literary Reference

-Taminco Proprietary Studies

Disclaimer: The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of Safety Data Sheet