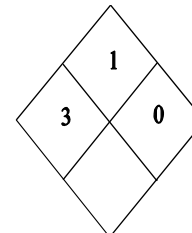


MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION



PRODUCT NAME(S): FORTRESS® 5G Granular Insecticide

GENERAL USE: Insecticide

PRODUCT DESCRIPTION: Gray to reddish brown granule

EPA Registration Number: 5481-493; 352-552-5481

MSDS No.: 287_4

Current MSDS Revision Date: 12 May, 2004

MANUFACTURER:
 AMVAC CHEMICAL CORPORATION
 4100 E. Washington Blvd.
 Los Angeles, CA 90023-4406
 Ph: 323-264-3910
 FAX: 323-268-1028

EMERGENCY TELEPHONE NUMBERS:
MANUFACTURER: 323-264-3910
TRANSPORTATION (24 HOURS)
CHEMTREC(USA): 800-424-9300
OTHER (24 HOURS)
AMVAC: 323-264-3910

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	WT %	CAS No.
Chlorethoxyfos (O,O-Diethyl O-(1,2,2,2-tetrachloroethyl)-phosphorothioate)	5.0%	54593-83-8
Inert Ingredients Including:	95.0%	
Crystalline Silica (as a portion of the inert ingredients)	< 10%	14808-60-7

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)

COMPONENT	HAZARD	OSHA PEL*	ACGIH TLV*	OTHER*
Chlorethoxyfos	POISON			AMVAC AEL = 0.05 mg/m ³
Crystalline Silica	Pulmonary fibrosis, silicosis	10 mg/m ³ (respirable)	0.05 mg/m ³ (respirable)	AMVAC AEL = 0.1 mg/m ³ (respirable)

* Exposure Limits 8 hrs. TWA

FORTRESS is a registered trademark of AMVAC Chemical Corporation
 SMARTBOX is a registered trademark of Syngenta.

3. **HAZARDS IDENTIFICATION**

EMERGENCY OVERVIEW:

DANGER! POISON! Fatal if swallowed, inhaled or absorbed through skin or eyes. Rapidly absorbed through skin. Repeated inhalation or skin contact may, without symptoms, progressively increase susceptibility to organophosphate poisoning.

KEEP OUT OF REACH OF CHILDREN!

TOXIC to fish, birds and other wildlife. Do not contaminate water bodies with this product.

POTENTIAL HEALTH EFFECTS

ROUTE(S) OF ENTRY: May be fatal if absorbed through the eye or skin, is ingested or is inhaled. May produce acute cholinesterase depression.

SIGNS OF ACUTE OVEREXPOSURE: Acute cholinesterase depression may be evidenced by headache, nausea, vomiting, diarrhea, abdominal cramps, excessive sweating, salivation and tearing, constricted pupils, blurred vision, tightness in chest, weakness, muscle twitching and confusion; in extreme cases, unconsciousness, convulsions, severe respiratory depression and death may occur.

SIGNS OF CHRONIC OVEREXPOSURE: Repeated exposures to small doses of Chlorethoxyfos (FORTRESS®) and other organophosphates may lower the cholinesterase to levels where the above symptoms of acute overexposure are observed.

CARCINOGENICITY: None of the components of FORTRESS® Technical has been found to be carcinogenic. Crystalline silica, a component of one of the formulation ingredients, is listed as a carcinogen.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Preexisting conditions which lower cholinesterase levels increase vulnerability to cholinesterase depression. These include: (for plasma) genetic cholinesterase deficiency; advanced liver disease; chronic alcoholism; malnutrition; dermatomyositis; existing toxicity from exposure to carbon disulfide; benzalkonium salts, organic mercury compounds, ciguatoxins or solanines; and (for RBC) hemolytic anemias.

4. FIRST AID MEASURES

CHLORETHOXYFOS (FORTRESS®) IS A SEVERE CHOLINESTERASE INHIBITOR. A PHYSICIAN SHOULD BE CONTACTED IN ALL CASES OF EXPOSURE TO FORTRESS® AND ITS FORMULATIONS.

CAUTION: Persons attending victim should avoid direct contact with heavily contaminated clothing or vomitus. Rubber gloves should be worn by the emergency responder or medical personnel while washing the pesticide from skin and hair of the exposed victim.

EYES: Immediately flush the eyes with copious amounts of clear, cool running water for a minimum of 15 minutes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eyes and lids with water. Contact a physician immediately. If there will be a delay in getting medical attention, rinse the eyes for at least another 15 minutes.

INHALATION: Remove victim to fresh air. If breathing has ceased, clear the victim's airway and start mouth-to-mouth artificial respiration. If breathing is difficult, give oxygen. Contact a physician immediately.

INGESTION: Induce vomiting immediately by giving two glasses of water and giving Syrup of Ipecac according to directions on the bottle or by sticking finger down throat. Never give anything by mouth to an unconscious or convulsing person. Contact a physician immediately.

SKIN: Immediately flush all affected areas with large amounts of clear water for at least 15 minutes. Remove contaminated clothing. Do not attempt to neutralize with chemical agents. Wash clothing before reuse. Contact a physician immediately.

NOTE TO PHYSICIANS: This is an Organophosphate (OP) Insecticide. Do not wait for laboratory confirmation to treat patients with strong clinical evidence of poisoning. For further information on the treatment of organophosphate poisonings contact your local or state poison control center. Make certain medical personnel are protected from direct contact with contaminated skin, clothing, and vomitus.

Establish airway and oxygenation. IV Atropine sulfate is the antidote of choice against parasympathetic nervous stimulation. If there are signs of parasympathetic stimulation, Atropine Sulfate should be injected at 10 minute intervals in doses of 1 to 2 milligrams until complete atropinization has occurred. Pralidoxime chloride (2-PAM chloride) may also be used as an effective antidote in addition to and while maintaining full atropinization. In adults, an initial dose of 1 gram of 2-PAM should be injected, preferably as an infusion, in 250 cc of saline over a 15 to 20 minute period. If this is not practical, 2-PAM may be administered slowly by intravenous injection as a 5% solution in water over not less than 2 minutes. After about an hour, a second dose of 1 gram of 2-PAM will be indicated if muscle weakness has not been relieved. For infants and children, the dose of 2-PAM is 0.25 grams. Avoid morphine, aminophylline, phenothiazines, reserpine, furosemide and ethacrynic acid. Clear chest by postural drainage. Oxygen administration may be necessary. Observe patient continuously for 48 hours. Repeated exposure to cholinesterase inhibitors may without warning cause prolonged susceptibility to very small doses of any cholinesterase inhibitor. Allow no further exposure until time for cholinesterase regeneration has been attained as determined by a blood test.

4. **FIRST AID MEASURES, cont'd**

Bathe and shampoo contaminated skin and hair. If ingested, empty stomach; activated charcoal may be useful to further limit absorption. If victim is alert, Syrup of Ipecac (2 tablespoons in adults, 1 tablespoon in small children) followed by water (2 glasses for adults, 1 glass for children) is indicated. If symptoms such as loss of gag reflex, convulsions, or unconsciousness occur before emesis, gastric lavage should be considered following intubation with a cuffed endotracheal tube.

5. **FIRE FIGHTING MEASURES**

FLAMMABLE PROPERTIES

Not a fire or explosion hazard

HAZARDOUS COMBUSTION PRODUCTS: This product will emit toxic fumes when burned, including carbon monoxide. Vapors of the unburned product may also be hazardous. Contact with the fumes and vapors should be avoided by staying upwind and by wearing impervious clothing and positive pressure self-contained breathing apparatus.

EXTINGUISHING MEDIA: Foam, dry chemical, carbon dioxide, water spray (fog).

FIRE FIGHTING INSTRUCTIONS: Evacuate nonessential personnel from the area. Keep upwind. Wear self-contained breathing apparatus and impervious clothing, including gloves and eye protection. Clean all clothing before reuse. Severely contaminated clothing cannot be adequately decontaminated, and must be disposed as a hazardous waste. Shower with soap and water after contact with this product.

6. **ACCIDENTAL RELEASE MEASURES**

GENERAL: Evacuate personnel and thoroughly ventilate the area. Use adequate ventilation and air-supplied respirators, as well as impervious clothing and safety goggles. Keep bystanders upwind and away from the spill.

SMALL SPILL: For spills during agricultural use see the label.

LARGE SPILL: Ventilate for a minimum of one hour unless this is a fresh spill. Wear appropriate personal protective equipment (see Section 8) during clean-up. Shovel first, then sweep material into a fiber drum (e.g., overpak) with a plastic bag liner. Do not vacuum dust. Spill area and tools can be washed with soap and water or with dilute caustic or aqueous ammonia. Treat the washings as a hazardous waste. See section 13 (Disposal Considerations) for further information.

7. HANDLING AND STORAGE

HANDLING: Prevent skin contact. Do not breathe fumes. Wear appropriate personal protective equipment (PPE, Section 8). Wash thoroughly and change clothes after handling. Wash clothes separately; do not wash heavily contaminated clothing. Dispose of heavily contaminated clothing as a hazardous waste. Keep product away from food drink, cosmetics, and tobacco products. See product label for more detailed handling procedures.

STORAGE: Do not contaminate water, food or feed by storage or disposal. Store product in a cool, dry, locked place out of reach of children. Store in original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: A well-ventilated area is recommended for handling FORTRESS® Insecticide, Technical. Use of mechanical or local exhaust systems is recommended.

RESPIRATORY PROTECTION: A NIOSH/MSHA approved air-purifying respirator equipped with organic vapor cartridges or canisters is required when anyone is working with or near open containers of this product. It is recommended that canisters be replaced after eight hours use or at the end of each shift, whichever comes first. For emergency and other conditions where the exposure limit may be greatly exceeded, use an approved positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply.

SKIN PROTECTION: Anyone working with or near open containers of this product must wear the following protective equipment: an impervious protective suit of one or two pieces that covers all parts of the body except head, hands, and feet; chemical resistant gloves (i.e., nitrile gloves); chemical resistant shoes (or chemical resistant coverings or boots); goggles or faceshield; hood or wide brimmed hat. Always wash hands, face, and arms with soap and clean water before eating, drinking, using cosmetics, smoking, or going to the toilet. For more information see the product label.

EYE PROTECTION: Goggles or safety glasses and a faceshield are required for anyone who is working with or near open containers of this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Appearance:	gray to reddish brown clay granule
Odor:	Slight sulfurous
Odor threshold:	Not available
Boiling Point:	Not applicable
Melting Point:	Not available for product
Specific Gravity:	Not determined
Bulk Density (loose):	40 lb/cu ft
Bulk Density (packed):	45 lb/cu ft
Vapor Pressure (mm/Hg):	1.7 x 10 ⁻³ mm Hg @ 25°C (a.i.)

9. **PHYSICAL AND CHEMICAL PROPERTIES, cont'd**

Vapor Density (a.i.):	11.6 (air = 1)
Percent Volatile by Vol:	Not available
Solubility in Water:	3 ppm @ 20°C (68°F)
Solubility (Other):	Soluble in aliphatic and aromatic solvents, ketones
Partition Coefficient (O/W):	Not available
pH (5% mix with water):	Not determined
Evaporation Rate:	Not available

10. **STABILITY AND REACTIVITY**

CHEMICAL STABILITY (Conditions to avoid): This product is stable under normal use and storage conditions.

INCOMPATIBILITY: Avoid strong oxidizers, strong bases, heat, and sources of ignition.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating product to decomposition will cause emission of acrid smoke and fumes of phosphorous oxides and carbon oxides.

HAZARDOUS POLYMERIZATION: This product will not polymerize.

11. **TOXICOLOGICAL INFORMATION**

INGESTION:	Oral LD ₅₀ (rat):	44 mg/kg (female); 124 mg/kg (male)
INHALATION:	Inhalation LC ₅₀ (rat):	64 mg/m ³ (female); 205 mg/m ³ (male) (4 hr)
DERMAL:	Skin LD ₅₀ (rabbit):	> 2000 mg/kg
IRRITATION:	Eye irritation:	mild eye irritant
	Skin irritation:	Not a skin irritant
OTHER:	Skin sensitization:	Not a sensitizer
	(guinea pig)	

The following toxicity studies were all done with FORTRESS® Technical Insecticide.

TERATOGENICITY: No evidence of teratogenic toxicity in rats or rabbits.

MUTAGENICITY: No evidence of mutagenicity was found in a range of laboratory tests.

CARCINOGENICITY: Fortress® Technical is not oncogenic when tested in both the rat or mouse. Respirable crystalline silica, present at less than 0.1% in the formulation, has been found to be a carcinogen.

REPRODUCTIVE TOXICITY: No evidence of reproductive toxicity has been seen in laboratory tests.

TOXICOLOGICAL SYNERGISTIC PRODUCTS: No data available.

12. ECOLOGICAL INFORMATION

No data is available for this product. However, the active ingredient in this product is extremely toxic to fish, birds, and other wildlife. Keep out of any body of water. Do not contaminate water when disposing of equipment washwaters or wastes. Notify authorities if any exposure to the general public or environment occurs or is likely to occur.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed by use according to label instructions, contact your nearest State Pesticide or Environmental Control Agency, the Hazardous Waste representative at the nearest EPA regional office or national equivalent to these agencies, for guidance. Open dumping is prohibited.

Container Disposal: Do not discard "SMARTBOX™" container. All "SMARTBOX™" containers must be returned to the place where they were purchased. Contact AMVAC Customer Service (323-264-3910) for instructions in the event any difficulty in return of the "SMARTBOX™" is experienced. Do not attempt to open or tamper with the "SMARTBOX™". Once empty, the "SMARTBOX™" is not intended for reuse by the user.

14. TRANSPORTATION INFORMATION

DOT Class:	6.1
UN Number:	2783
IMDG Class (sea):	6.1
IATA Class:	6.1
Marine Pollutant:	Yes (If by water or in bulk)
Packing Group:	II
Hazard Label(s):	TOXIC
ADR Class (road):	6.1
Proper Shipping Name(s):	Organophosphorus pesticide(s), solid, toxic (Chlorethoxyfos)
Reportable Quantity:	No

PACKAGING

General Description: 50 lb "SMARTBOX™"

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

This product is registered under EPA/FIFRA Regulations. It is a violation of Federal Law to use this product in any manner inconsistent with its labeling. Read and follow all label directions. This product is excluded from listing requirements under EPA/TSCA.

15. REGULATORY INFORMATION, cont'd

SARA TITLE III DATA

Section 311 & 312 Hazard Categories:

Immediate Health Hazard:	Yes
Delayed Health Hazard:	No
Fire Hazard:	No
Reactive Hazard:	No
Sudden Pressure Release Hazard:	No

Section 302 Extremely Hazardous Substances: None

Section 313 Toxic Chemicals: None

CERCLA/EHS Reportable Quantities (RQ): None

RCRA Hazardous Waste Codes: None

STATE REGULATIONS:

CALIFORNIA (Proposition 65): This product may contain respirable crystalline silica, known to the State of California to cause cancer.

16. OTHER INFORMATION

MSDS Status:

Date This Revision: 12 May, 2004

Date Previous Revision: 6/13/02

Person Responsible for Preparation: Gary A. Braden

Reasons for Revision: Changes were made in sections 1, 2, 6, 9, and 11 to make the information current and easier to read and to update formatting to reflect current practice.

DISCLAIMER:

This information is provided for the limited guidance to the user. While AMVAC believes that the information is, as of the date hereof, reliable, it is the user's responsibility to determine the suitability of the information for its purposes. The user is advised not to construe the information as absolutely complete since additional information may be necessary or desirable when particular, exceptional, or variable conditions or circumstances exist (like combinations with other materials), or because of applicable regulations. No express or implied warranty of merchantability or fitness for a particular purpose or otherwise is made hereunder with respect to the information or the product to which the information relates.

16. OTHER INFORMATION, cont'd

ABBREVIATIONS:

ACGIH	-	American Conference of Governmental Industrial Hygienists
ADR	-	European <u>A</u> greement Concerning the International Carriage of <u>D</u> angerous Goods by <u>R</u> oad
AEL	-	Acceptable Exposure Limit (Self-imposed Internal Company Limit)
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
EHS	-	Extremely Hazardous Substances
EPA	-	Environmental Protection Agency
FIFRA	-	Federal Insecticide, Fungicide, and Rodenticide Act
IARC	-	International Agency for Research on Cancer
NTP	-	National Toxicology Program
OSHA	-	Occupational Safety and Health Agency
SARA	-	Superfund Amendments and Reauthorization Act
TSCA	-	Toxic Substances Control Act

This is the last page of this MSDS. There should be 9 pages.