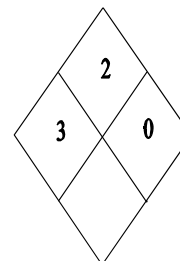


## MATERIAL SAFETY DATA SHEET

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** FOLEX® 6 EC COTTON DEFOLIANT  
**CHEMICAL NAME:** Not applicable (blend)  
**GENERAL USE:** Defoliant (cotton)  
**PRODUCT DESCRIPTION:** Amber liquid with a petroleum distillates odor  
**EPA Registration Number:** 5481-504; 264-498-5481  
**MSDS No.:** 300\_4  
**Revision Date:** 13 September, 2005



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

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

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	WT % (w/v)	CAS No.
Tribufos (S,S,S-Tributyl phosphorotrithioate)	70.5%	78-48-8
Other ingredients (Includes Naphthalene)	29.5% (1-5%)	91-20-3

#### OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)

COMPONENT	HAZARD	OSHA PEL*	ACGIH TLV*
Tribufos (78-48-8)	POISON	None established	None established
Petroleum Hydrocarbons (64742-94-5)	Flammable	None established	None established
Naphthalene (91-20-3)	POISON	10 ppm	10 ppm

\* Exposure Limits 8 hrs. TWA

FOLEX is a registered trademark of AMVAC Chemical Corporation.

### 3. HAZARDS IDENTIFICATION

---

#### EMERGENCY OVERVIEW:

**DANGER! POISON!** Poisonous if swallowed, inhaled or absorbed through skin and eyes. Repeated inhalation or skin contact may, without symptoms, progressively increase susceptibility to Tribufos poisoning. **CAUTION!** Skin and Eye irritant. Prolonged exposure may cause skin burns and irreversible eye damage.

**CAUTION! FLAMMABLE!** Keep away from sources of ignition.

**KEEP away from children!**

**TOXIC to fish. Do not contaminate bodies of water.**

---

#### POTENTIAL HEALTH EFFECTS

**ROUTE(S) OF ENTRY:** May be fatal if product is ingested, inhaled, or absorbed through the eye or skin.

**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. It should also be noted that because of the presence of petroleum distillates, this product is moderately irritating to the skin and eyes. Prolonged or repeated liquid contact can result in defatting and drying of the skin, which may result in skin irritation and dermatitis. Vapors of petroleum distillates may produce CNS (Central Nervous System) depression. Continued exposure of skin and eyes to vapors or liquids may result in burns and/or irreversible damage.

**SIGNS OF CHRONIC OVEREXPOSURE:** Repeated exposures to small doses of Tribufos and other organophosphates may lower the cholinesterase to levels where the above symptoms of acute overexposure are observed. Repeated exposure to the petroleum distillates solvent may lead to severe CNS depression. Typically the exposures to Tribufos will cause toxicity problems well before any problems from the solvent arise.

**CARCINOGENICITY:** This product contains small amounts of Naphthalene, a chemical that has recently been listed as possibly carcinogenic to humans (Group 2B) by IARC.

3. **HAZARDS IDENTIFICATION, cont'd**

**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. In addition, near fatal exposures may result in congestive effects to a wide variety of organs based on the presence of petroleum distillates.

---

4. **FIRST AID MEASURES**

**TRIBUFOS (FOLEX®) IS A CHOLINESTERASE INHIBITOR. A PHYSICIAN SHOULD BE CONTACTED IN ALL CASES OF EXPOSURE TO TRIBUFOS 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:** DO NOT induce vomiting. If victim is conscious, administer an 8 oz. glass of water containing 2 tbsp. activated charcoal. Have person lie on their left side to slow down absorption of the ingested material. Never give anything by mouth to an unconscious 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.

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

**NOTE TO PHYSICIANS:** This is an Organophosphate (OP) Insecticide. Do not wait for laboratory confirmation to treat patients with strong clinical evidence of poisoning. Contact your local poison control center for further recommendations regarding control of poisoning, emergency treatment, and other information regarding the toxicity of Tribufos. A possible method of treatment is given below.

**Do Not** handle the patient without the following protective equipment in place: chemical resistant gloves and apron (preferably nitrile). Remove contaminated clothing and do not reuse without thorough cleaning with detergent and hot water. Dispose of heavily contaminated clothing, including shoes, as a hazardous waste.

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, phenothiazine, 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.

Bathe and shampoo contaminated skin and hair. If ingested, empty stomach. Due to the presence of aromatic solvents, gastric lavage should be considered following intubation with a cuffed endotracheal tube to prevent aspiration of vomitus. Activated charcoal is useful to further limit absorption.

---

#### **5. FIRE FIGHTING MEASURES**

##### **FLAMMABLE PROPERTIES**

Flash Point: 184°F (Setaflash)

Autoignition Temperature: 830°F (approximate)

Flammable Limits:

Lower flammable limit: Not established

Upper flammable limit: Not established

Flammability: This is a combustible liquid that will burn when heated (NFPA rating = 2)

##### **EXPLOSIVITY**

Mechanical Impact: Will not occur

Static Discharge: Due to the solvent, this product can accumulate static charges which can cause an incendiary electrical discharge. Even empty containers may contain sufficient residues to cause an explosion.

## 5. FIRE FIGHTING MEASURES, cont'd

**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. Remove sources of heat, sparks, flame, impact, friction or electricity. If unable to extinguish fire, let burn until consumed. Use sparkproof equipment for cleanup. 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:** Cover with nonflammable absorbent (clay, sand, oil dry, kitty litter, etc.) to absorb the liquid. Sweep into an open plastic drum. Decontaminate the area and equipment with dilute alkali or ammonia (less than 5% solution) and detergent. Flush the area with water. Absorb and sweep into the same open plastic drum. Close the drum and dispose of as a hazardous waste.

**LARGE SPILL:** Dike the spill to prevent contamination of local water sources. Siphon the majority of the liquid into drums for use or disposal, depending on the circumstances. Clean the area as described for a small spill.

---

## 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 FOLEX® 6 EC. Use of mechanical or local exhaust systems is recommended. See label or contact your distributor for more complete instructions.

**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. A maximum use of eight hours is recommended. 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. See label or contact your distributor for more complete instructions.

**SKIN PROTECTION:** Anyone working with or near open containers of this product must wear the following protective equipment: a 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); 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 or contact your distributor.

**EYE PROTECTION:** Goggles or safety glasses and a faceshield are required for anyone who is working with or near open containers of this product. See label or contact your distributor for more complete instructions. An emergency eye wash must be readily accessible to the work area.

---

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State:</b>	Liquid
<b>Appearance:</b>	Amber liquid
<b>Odor:</b>	Pungent odor
<b>Odor Threshold:</b>	Not available
<b>Boiling Point:</b>	Not established
<b>Freezing/Melting Point:</b>	Less than -20°F
<b>Specific Gravity:</b>	1.018 @ 20 °C/20 °C
<b>Bulk Density:</b>	8.50 lb/gal
<b>Vapor Pressure (mm/Hg):</b>	$1.7 \times 10^{-6}$ mm Hg @ 20°C (for Tribufos)
<b>Vapor Density:</b>	Heavier than air
<b>Percent Volatile by Vol:</b>	Not available
<b>Solubility in Water:</b>	Emulsifies
<b>Solubility (Other):</b>	Soluble in aromatic solvents
<b>Partition Coefficient (O/W):</b>	Not available
<b>pH (1% emulsion in water):</b>	Not established
<b>Evaporation Rate:</b>	Not established

---

## 10. STABILITY AND REACTIVITY

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

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

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

**HAZARDOUS POLYMERIZATION:** This product will not polymerize.

---

## 11. TOXICOLOGICAL INFORMATION

<b>INGESTION:</b>	Oral LD <sub>50</sub> (rat):	570 mg/kg (male), 349 mg/kg (female)
<b>INHALATION:</b>	Inhalation LC <sub>50</sub> (rat):	3.55 mg/L (male), 2.34 mg/L (female) (4 hr, aerosol)
<b>DERMAL:</b>	Skin LD <sub>50</sub> (rabbit):	Greater than 2000 mg/kg (male & female)
<b>IRRITATION:</b>	Eye irritation:	Potentially severely irritating and corrosive
	Skin irritation:	Potentially severely irritating and corrosive
<b>SENSITIZATION:</b>	Skin sensitization: (guinea pig)	Tribufos is not a sensitizer

**TERATOGENICITY:** No evidence of teratogenicity in tests with Tribufos on laboratory animals.

**MUTAGENICITY:** No evidence of mutagenicity from *in vivo* and *in vitro* studies using Tribufos.

**CARCINOGENICITY:** Tribufos was investigated for carcinogenicity in chronic feeding studies using mice and rats at maximum levels of 250 and 320 ppm, respectively. In mice, at the highest dose tested, a dose which exceeded the maximum tolerated dose (MTD), neoplastic changes were observed in the small intestine, liver, and lungs. There was no evidence of a carcinogenic potential observed in rats. IARC found there was sufficient evidence that Naphthalene causes cancer in animals to list it as a possible carcinogen for people (Group 2B).

**REPRODUCTIVE TOXICITY:** There was evidence of reproductive effects in the rat at the highest dose level of Tribufos tested, in conjunction with maternal toxicity.

**NEUROTOXICITY:** There was evidence of delayed neurotoxicity in the hen.

**TOXICOLOGICALLY SYNERGISTIC PRODUCTS:** No data available.

---

## 12. ECOLOGICAL INFORMATION

**General:** This product is 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.

---

### **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, or the Hazardous Waste representative at the nearest EPA regional office for guidance. Open dumping is prohibited.

**Container Disposal:** Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of container in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke. Contact your nearest State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA regional office for guidance. Open dumping is prohibited.

---

### **14. TRANSPORTATION INFORMATION**

DOT Class:	6.1
UN Number:	UN3018
IMDG Class (sea):	6.1
IATA (air):	6.1
Marine Pollutant:	Yes
Packing Group:	III
Hazard Label(s):	Toxic
ADR Class (road):	6.1
Proper Shipping Name(s):	Organophosphorus pesticide(s), liquid, toxic (Tribufos)
Reportable Quantity: (DOT, 172.101, Appendix A)	Yes (only in bulk at 3846 lb or more)

### **PACKAGING**

General Description:	2.5 gal plastic bottle and 30 gal drum
----------------------	--

---

### **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:	Yes
Fire Hazard:	Yes
Reactive Hazard:	No
Sudden Pressure Release Hazard:	No

**Section 302 Extremely Hazardous Substances:** None

**Section 313 Toxic Chemicals:** Tribufos (78-48-8) 70.5%

Naphthalene (91-20-3) - 1 to 5% (v/v)

**CERCLA Reportable Quantities (RQ):** Naphthalene - 100 lbs; Product - 3846 lbs

**STATE REGULATIONS:**

**CALIFORNIA (Proposition 65):** This product contains Naphthalene, a chemical known to the State of California to cause cancer.

---

16. **OTHER INFORMATION**

**MSDS Status:**

**Date This Revision:** 13 September, 2005

**Date Previous Revision:** 16 September 2003

**Person Responsible for Preparation:** Gary A. Braden

**Reasons for Revision:** Formatting changes were made in various areas throughout the MSDS to update the document to current AMVAC accepted formatting.

**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
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
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
DOT	-	Department of Transportation (USA)
IMDG	-	International Maritime Dangerous Goods
IATA	-	International Air Transport Association

---

This is the last page of this MSDS. There should be 10 pages.