



**Material Safety Data Sheet**

**DEF® 6 EMULSIFIABLE DEFOLIANT VERY LOW ODOR**

MSDS Number: 102000016709  
 MSDS Version 2.0  
 Revision Date: 09/05/2007

**SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION**

**Product Name** DEF® 6 EMULSIFIABLE DEFOLIANT VERY LOW ODOR  
**MSDS Number** 102000016709  
**EPA Registration No.** 264-730

Bayer CropScience  
 2 T.W. Alexander Drive  
 Research Triangle PK, NC 27709  
 USA

For MEDICAL, TRANSPORTATION or other EMERGENCY call: 1-800-334-7577 (24 hours/day)  
 For Product Information call: 1-866-99BAYER (1-866-992-2937)

**SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS**

<u>Hazardous Component Name</u>	<u>CAS-No.</u>	<u>Average % by Weight</u>
Tribufos	78-48-8	70.50
Naphthalene	91-20-3	2.40
Trade Secret Ingredient(s)		

**SECTION 3. HAZARDS IDENTIFICATION**

*NOTE: Please refer to Section 11 for detailed toxicological information.*

**Emergency Overview** Danger! Corrosive - causes irreversible eye damage. Causes skin burns. May be fatal if swallowed. Harmful if inhaled or absorbed through skin. Do not get in eyes, on skin, or on clothing. Avoid inhalation of vapour or mist.

**Physical State** liquid

**Appearance** colourless to yellow

**Routes of Exposure** Ingestion, Inhalation, Eye contact, Skin contact, Skin Absorption

**Immediate Effects**

**Eye** Corrosive - causes irreversible eye damage. Causes redness, irritation, tearing. Do not get in eyes.

**Skin** Corrosive Causes burns. Causes irritation, redness, swelling. Harmful if absorbed through skin. Do not get in eyes, on skin, or on clothing.



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<b>Ingestion</b>	May be fatal if swallowed. Do not take internally. May cause anxiety, nausea, vomiting, abdominal cramps, diarrhea, dizziness, headache, excess salivation, pinpoint pupils, profuse sweating, muscle weakness, respiratory depression, decreased blood pressure, convulsions.
<b>Inhalation</b>	May cause nose, throat, and lung irritation. High vapor/aerosol concentrations (greater than approximately 1,000 ppm) are irritating to the eyes and the respiratory tract, may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects. Harmful if inhaled. Avoid inhalation of vapour or mist.
<b>Chronic or Delayed Long-Term</b>	This product or its components may have target organ effects. This product or its components may have long term (chronic) health effects.
<b>Medical Conditions Aggravated by Exposure</b>	Any disease, medication or prior exposure which reduces normal cholinesterase activity may increase susceptibility to the toxic effects of the active ingredient. Allow no further exposure to any cholinesterase inhibitor until full recovery is assured. Skin contact may aggravate existing skin disease.
<b>Potential Environmental Effect</b>	Toxic to fish and aquatic invertebrates.

**SECTION 4. FIRST AID MEASURES**

<b>General</b>	When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.
<b>Eye</b>	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 physician or poison control center immediately.
<b>Skin</b>	Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.
<b>Ingestion</b>	Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.
<b>Inhalation</b>	Move 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 physician or poison control center immediately.
<b>Notes to Physician Hazards</b>	This product is a cholinesterase inhibiting organophosphorous pesticide. Contains hydrocarbon solvents. May pose an aspiration pneumonia hazard.
<b>Treatment</b>	The product inhibits cholinesterase resulting in stimulation of the central nervous



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system, the parasympathetic nervous system, and the somatic motor nerves.

Administer atropine sulphate as antidote. Watch for pulmonary edema, which may develop in serious cases of poisoning even after 24-48 hours. At first sign of pulmonary edema, the patient should be placed in an oxygen tent and treated symptomatically.

**SECTION 5. FIRE FIGHTING MEASURES**

<b>Flash point</b>	84.4 °C / 183.9 °F
<b>Fire and Explosion Hazards</b>	The product is combustible.
<b>Suitable Extinguishing Media</b>	Water spray, Carbon dioxide (CO2), Dry chemical, Foam
<b>Fire Fighting Instructions</b>	Keep out of smoke. Fight fire from upwind position. Cool closed containers/ tanks exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses.  Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

<b>Personal Precautions</b>	Keep unauthorized people away. Isolate hazard area. Avoid contact with spilled product or contaminated surfaces.
<b>Methods for Cleaning Up</b>	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder). Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations.
<b>Additional Advice</b>	Use personal protective equipment. Do not allow to enter soil, waterways or waste water canal. Do not allow product to contact vegetation.

**SECTION 7. HANDLING AND STORAGE**

<b>Handling Procedures</b>	Maintain exposure levels below the exposure limit through the use of general and local exhaust ventilation. Handle and open container in a manner as to prevent spillage.  Keep away from heat and sources of ignition.
<b>Storing Procedures</b>	Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original



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container and out of the reach of children, preferably in a locked storage area.

**Work/Hygienic Procedures**

Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.

Remove Personal Protective Equipment (PPE) immediately after handling this product. Before removing gloves clean them with soap and water. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

Remove contaminated clothing immediately and dispose of safely.

**Min/Max Storage Temperatures**

Do not transport or store below -18 °C / -0 °F  
Do not transport or store above 38 °C / 100 °F  
The 30-day storage temperature average must not exceed the recommended maximum.

**SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**General Protection**

Follow all label instructions. Train employees in safe use of the product.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

Eye wash facility and safety shower should be available.

**Eye/Face Protection**

Tightly fitting safety goggles  
or  
Face-shield

**Hand Protection**

Chemical-resistant gloves (barrier laminate, butyl rubber, nitrile rubber or Viton)

**Body Protection**

Wear long-sleeved shirt and long pants and shoes plus socks.

**Respiratory Protection**

When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

**Exposure Limits**

Naphthalene	91-20-3	ACGIH	TWA	10 ppm
		ACGIH	STEL	15 ppm
		NIOSH	REL	10 ppm 50 mg/m3
		NIOSH	STEL	15 ppm 75 mg/m3
		OSHA Z1	PEL	10 ppm 50 mg/m3
		OSHA Z1A	TWA	10 ppm 50 mg/m3
		OSHA Z1A	STEL	15 ppm 75 mg/m3
		US CA OEL	TWA PEL	10 ppm 50 mg/m3
		US CA OEL	STEL	15 ppm 75 mg/m3



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**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance</b>	colourless to yellow
<b>Physical State</b>	liquid
<b>Density</b>	approx. 1.02 g/cm <sup>3</sup> at 20 °C
<b>Melting / Freezing Point</b>	< -28.9 °C / -20.0 °F

**SECTION 10. STABILITY AND REACTIVITY**

<b>Conditions to Avoid</b>	Heat, flames and sparks. Elevated temperatures Unstable under alkaline conditions.
<b>Hazardous Reactions</b>	Stable under recommended storage conditions.

**SECTION 11. TOXICOLOGICAL INFORMATION**

Only acute toxicity studies have been performed on this product as formulated. The non-acute information pertains to the technical-grade active ingredient, tribufos.

<b>Acute Oral Toxicity</b>	male rat: LD50: 570 mg/kg
	female rat: LD50: 349 mg/kg
<b>Acute Dermal Toxicity</b>	rat: LD50: > 2,000 mg/kg



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**Acute Inhalation Toxicity** male rat: LC50: 3.6 mg/l  
Exposure time: 4 h  
Determined in the form of liquid aerosol.

female rat: LC50: 2.3 mg/l  
Exposure time: 4 h  
Determined in the form of liquid aerosol.

male rat: LC50: 3.6 mg/l  
Exposure time: 1 h  
Determined in the form of liquid aerosol.  
Extrapolated from the 4 hr LC50.

female rat: LC50: 2.3 mg/l  
Exposure time: 1 h  
Determined in the form of liquid aerosol.  
Extrapolated from the 4 hr LC50.

**Skin Irritation** rabbit: Severe skin irritation.

**Eye Irritation** Corrosive - may cause irreversible eye damage based on the severe skin irritation hazard of this product.

**Sensitization** guinea pig: Non-sensitizing.

**Chronic Toxicity** Tribufos caused eye effects, cholinesterase inhibition and/or hematological changes in chronic studies in rats and dogs.

**Assessment Carcinogenicity**

Tribufos was not carcinogenic in a lifetime feeding study in rats. In mice, tribufos caused an increase in multiple tumor types in both sexes at the highest dose tested. Based on these findings, EPA classified tribufos as "unlikely human carcinogen" at low doses.

**ACGIH**

Naphthalene	91-20-3	Group A4
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**NTP**

Naphthalene	91-20-3	
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**IARC**

Naphthalene	91-20-3	Overall evaluation: 2B
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**OSHA**

None.

**Reproductive & Developmental Toxicity** REPRODUCTION: Tribufos was not a primary reproductive toxicant in a two-generation reproduction study in rats. Reproductive effects were observed only at doses that caused systemic toxicity in parental animals.

DEVELOPMENTAL TOXICITY: Tribufos was not a developmental toxicant in developmental toxicity studies in rats and rabbits.

**Neurotoxicity** Tribufos caused delayed neurotoxicity when tested in hens at high dose levels



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by the oral, dermal or inhalation routes of exposure. In acute and subchronic neurotoxicity screening studies in rats, tribufos caused neurobehavioral effects in conjunction with cholinesterase inhibition. In a developmental neurotoxicity screening study in rats, tribufos caused cholinesterase inhibition and reversible morphological changes in neural tissues in the offspring of high-dosed females.

**Mutagenicity** Tribufos was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

**SECTION 12. ECOLOGICAL INFORMATION**

**Environmental Precautions** Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor runoff or drift. Drift or runoff from treated areas may adversely affect non-target plants. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Apply this product as specified on the label.

**SECTION 13. DISPOSAL CONSIDERATIONS**

**General Disposal Guidance** 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 Disposal** Follow advice on product label and/or leaflet.

**RCRA Classification** The RCRA Classifications may be on the individual component(s) and not necessarily on the product as a whole.

91-20-3 Naphthalene  
US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261): U165

91-20-3 Naphthalene  
US. EPA Resource Conservation and Recovery Act (RCRA) U List of Hazardous Wastes (40 CFR 261.33(f) and 40 CFR 302 [CERCLA]): U165



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**SECTION 14. TRANSPORT INFORMATION**

TRANSPORTATION CLASSIFICATION:  
UN3018, Organophosphorus pesticides, liquid, toxic // 6.1 // PG III

FREIGHT CLASSIFICATION:  
Defoliant, plant, N.O.I.

**SECTION 15. REGULATORY INFORMATION**

This product contains material(s) which are Trade Secret and are on various Regulatory Lists. These material(s) are not listed below. If more information is required, call the product information number listed in Section 1.

**EPA Registration No.** 264-730

**US Federal Regulations**

**TSCA list**

Tribufos	78-48-8
Naphthalene	91-20-3

**US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)**

Naphthalene	91-20-3
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**SARA Title III - Section 302 - Notification and Information**

None.

**SARA Title III - Section 313 - Toxic Chemical Release Reporting**

Tribufos	78-48-8	1.0%
Naphthalene	91-20-3	0.1%

**US States Regulatory Reporting**

**CA Prop65**

This product contains a chemical known to the State of California to cause cancer.

Naphthalene	91-20-3
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This product does not contain any substances known to the State of California to cause reproductive harm.

**US State Right-To-Know Ingredients**

Tribufos	78-48-8	CA, NJ
Naphthalene	91-20-3	CA, CT, IL, MN, NJ, PA, RI

**Canadian Regulations**

**Canadian Domestic Substance List**

Naphthalene	91-20-3
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**Environmental**

**CERCLA**

Naphthalene	91-20-3	100 lbs
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**Clean Water Section 307 Priority Pollutants**

None.

**Safe Drinking Water Act Maximum Contaminant Levels**

None.

**International Regulations**

**European Inventory of Existing Commercial Substances (EINECS)**

Tribufos	78-48-8
Naphthalene	91-20-3

**SECTION 16. OTHER INFORMATION**

NFPA 704 (National Fire Protection Association):

Health - 3      Flammability - 2      Reactivity - 0      Others - none

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason to Revise: Updated due to new system and numbering scheme. Updated for general editorial purposes.

Revision Date: 09/05/2007

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