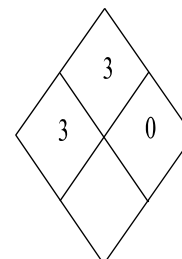


## MATERIAL SAFETY DATA SHEET

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: NUVAN® 50 EC  
CHEMICAL NAME: Not applicable (blend)  
GENERAL USE: Emulsifiable Concentrate insecticide  
PRODUCT DESCRIPTION: Amber liquid  
EPA REGISTRATION NUMBER: Not registered in U.S. - For Export Only.  
MSDS No.: 325\_2  
REVISION DATE: 8 September, 2008



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 %	CAS No.
Dimethyl 2,2-dichlorovinylphosphate (DDVP; Dichlorvos)	46.0%	62-73-7
Inert ingredients:		
Xylene	46.0%	1330-20-7
Mixed nonionic/anionic emulsifiers in solvents	8.0%	83590-10-7

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

COMPONENT	HAZARD	OSHA PEL*	ACGIH TLV*
DDVP (62-73-7)	Poison	1.0 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>
Xylenes (1330-20-7)	Dermatitis, Eye Irritant, Possible Carcinogen	100 ppm	100 ppm (150 ppm STEL; BEI 1.5 g Methyl hippuric acids/g creatine)

\* Exposure Limits 8 hrs. TWA

NUVAN is a Registered Trademark currently being transferred to AMVAC Chemical Corporation.

3. HAZARDS IDENTIFICATION

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**EMERGENCY OVERVIEW:**

**DANGER! POISON!** Poisonous if swallowed, inhaled or absorbed through skin and eyes. Rapidly absorbed through skin. Repeated inhalation or skin contact may, without symptoms, progressively increase susceptibility to Dichlorvos (DDVP) poisoning.

**FLAMMABLE LIQUID.** Do not use, pour, spill, or store near heat or open flame. Causes eye irritation. Causes skin irritation. **TOXIC to fish!** Do not contaminate bodies of water.

**KEEP AWAY FROM CHILDREN!**

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POTENTIAL HEALTH EFFECTS

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

**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. Due to the presence of the solvent ingestion or inhalation may produce central nervous system (CNS) depression. Ingestion of the solvent may result in vomiting. Aspiration (breathing) of the vomitus into the lungs must be avoided as even small quantities may result in aspiration pneumonitis (pneumonia).

**SIGNS OF CHRONIC OVEREXPOSURE:** Repeated exposures to small doses of DDVP and other organophosphates may lower the cholinesterase to levels where the above symptoms of acute overexposure are observed. In addition, there is evidence that chronic exposure to the solvent may cause central nervous system and congestive effects to a wide variety of internal organs.

**CARCINOGENICITY:** EPA under its 1999 proposed Guidelines for Carcinogen Risk Assessment has classified DDVP as having "suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential." IARC lists DDVP (Dichlorvos) as being possibly carcinogenic to humans (Group 2B). IARC has recently classified ethylbenzene, a component of the solvent, xylene, as possibly carcinogenic to humans (Group 2B).

**CARE SHOULD BE EXERCISED IN HANDLING DDVP AND ITS FORMULATIONS.**

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.

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4. **FIRST AID MEASURES**

**DDVP IS A CHOLINESTERASE INHIBITOR. A PHYSICIAN SHOULD BE CONTACTED IN ALL CASES OF EXPOSURE TO DDVP 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.

**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 DDVP (Dichlorvos). 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.

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

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. Activated charcoal is useful to further limit absorption.

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

##### **FLAMMABLE PROPERTIES**

Flash Point: 82°F/28°C (TCC)

Autoignition Temperature: 680°F (Xylene)

Flammable Limits:

Lower flammable limit: 0.9% (for Xylene)

Upper flammable limit: 6.0% (for Xylene)

Flammability: This is a flammable liquid that will burn when heated (NFPA rating = 3)

##### **EXPLOSIVITY**

Vapor-air mixtures of one of the components, Xylene, are known to be explosive when the compound is within the flammable limits listed above and the temperature is above the flashpoint. Xylene is sensitive to static discharge.

**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.

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## **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:** 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.

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## **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.

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

**ENGINEERING CONTROLS:** A well-ventilated area is recommended for handling NUVAN® 50 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.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION, cont'd

**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.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>PHYSICAL STATE:</b>	Liquid
<b>APPEARANCE:</b>	Amber liquid
<b>ODOR:</b>	Aromatic solvent odor
<b>ODOR THRESHOLD:</b>	Not available
<b>BOILING POINT:</b>	> 284°F/140°C
<b>FREEZING/MELTING POINT:</b>	< 14°F/-10°C
<b>SPECIFIC GRAVITY:</b>	1.067 g/mL (20°C)
<b>BULK DENSITY:</b>	8.91 lb/gal
<b>VAPOR PRESSURE (mm/Hg):</b>	Not available
<b>VAPOR DENSITY:</b>	Heavier than air
<b>PERCENT VOLATILE BY VOLUME:</b>	Not available
<b>SOLUBILITY IN WATER:</b>	Emulsifies
<b>SOLUBILITY (Other):</b>	Soluble in aromatic solvents and acetone
<b>PARTITION COEFFICIENT (O/W):</b>	Not available
<b>pH (1% emulsion in water):</b>	4 to 6
<b>EVAPORATION RATE:</b>	0.1 (compared to –Butyl acetate = 1.0)

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## 10. STABILITY AND REACTIVITY

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

**INCOMPATIBILITY:** Avoid water, strong oxidizers, strong acids, strong bases, heat, and sources of ignition. Is corrosive to aluminum and iron.

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

10. **STABILITY AND REACTIVITY, cont'd**

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

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11. **TOXICOLOGICAL INFORMATION**

**GENERAL:** The following information is for a similar formulation(f) or for the active ingredient. It should be used as a reference for use of this product.

<b>INGESTION:</b>	Oral LD <sub>50</sub> (rat):	95-116 mg/kg (f)
<b>INHALATION:</b>	Inhalation LC <sub>50</sub> (rat):	135-223 mg/m <sup>3</sup> (4 hr, vapor) (f)
<b>DERMAL:</b>	Skin LD <sub>50</sub> (rabbit):	1820-2653 mg/kg (f)
<b>IRRITATION:</b>	Eye irritation:	Irritant (f)
	Skin irritation:	Irritant (f)
<b>SENSITIZATION:</b>	Skin sensitization: (guinea pig)	Sensitizer (f)

**TERATOGENICITY:** Laboratory testing of DDVP Technical showed no evidence of teratogenicity in laboratory animals.

**MUTAGENICITY:** Laboratory testing of DDVP Technical showed no clear evidence of *in vivo* mutagenicity in mammalian assay systems.

**CARCINOGENICITY:** Two laboratory studies using DDVP Technical have shown a low incidence of forestomach tumors in the mouse and mononuclear cell leukemia in the F344 rat. EPA under its 1999 proposed Guidelines for Carcinogen Risk Assessment has classified DDVP as having "suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential". IARC lists DDVP (Dichlorvos) as being possibly carcinogenic to humans (Group 2B). IARC has recently classified ethylbenzene, a component of the solvent, xylenes, as possibly carcinogenic to humans (Group 2B), based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans.

**REPRODUCTIVE TOXICITY:** Reproductive effects with DDVP Technical have only been seen at a dose level which produced a generalized toxicity in the rat.

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

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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.

Acute Toxicity to Fish:	LC <sub>50</sub> (trout)	ca. 0.6 mg/L (96 hr) (Derived from active ingredient).
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**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 of 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 National, State or local authorities, by burning. If burned, stay out of smoke. Contact your nearest National, State or Environmental Control Agency, or the Hazardous Waste representative at the nearest Regulatory regional office for guidance. Open dumping is prohibited.

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**14. TRANSPORTATION INFORMATION**

<b>DOT CLASS:</b>	6.1
<b>UN NUMBER:</b>	UN3017
<b>IMDG CLASS (sea):</b>	6.1
<b>IATA (air):</b>	6.1
<b>MARINE POLLUTANT:</b>	Yes
<b>PACKING GROUP:</b>	II
<b>HAZARD LABEL(s):</b>	Toxic
<b>ADR CLASS (road):</b>	6.1
<b>PROPER SHIPPING NAME(s):</b>	Organophosphorus pesticide(s), liquid, toxic, flammable (Dichlorvos, Xylene)
<b>REPORTABLE QUANTITY: (DOT, 172.101, Appendix A)</b>	Yes

**PACKAGING**

**GENERAL DESCRIPTION:** 1 Liter bottle (10 x 1 L/case)

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**15. U.S. REGULATORY INFORMATION**

**U.S. FEDERAL REGULATIONS:** This product is not registered under EPA/FIFRA Regulations, and is for export only. Since it is a pesticide, 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. U.S. 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:** DDVP (Dichlorvos, 62-73-7)

**Section 313 Toxic Chemicals:** DDVP (Dichlorvos, 62-73-7) 46.0% %; Xylene (CAS 1330-20-7) - 46.0%; Ethylbenzene (CAS 100-41-4) - 6.2%  
Toluene (CAS 108-88-3) - < 0.3%

**CERCLA Reportable Quantities (RQ):** DDVP - 10 lbs; Xylene - 100 lbs; Ethylbenzene - 1000 lbs;  
Toluene - 1000 lbs; Product - 21.7 lbs

**STATE REGULATIONS:**

**CALIFORNIA (Proposition 65):** This product contains chemicals known to the State of California to cause cancer or reproductive effects - DDVP (Dichlorvos) and Toluene.

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**16. OTHER INFORMATION**

**MSDS STATUS:**

**Date This Revision: 8 September, 2008**

**Date Previous Revision: 4 August, 2004**

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

**REASONS FOR REVISION:** Annual Review. Information was updated in sections 2 and 11 to reflect current data on either this product or the active ingredient.

**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
DOT	-	Department of Transportation (USA)
EPA	-	Environmental Protection Agency
FIFRA	-	Federal Insecticide, Fungicide, and Rodenticide Act
IARC	-	International Agency for Research on Cancer
IATA	-	International Air Transport Association
IMDG	-	International Maritime Dangerous Goods
NTP	-	National Toxicology Program
OSHA	-	Occupational Safety and Health Agency
SARA	-	Superfund Amendments and Reauthorization Act
TSCA	-	Toxic Substances Control Act

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