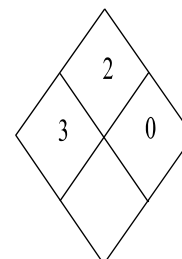


MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: NUVAN® 1000 EC
CHEMICAL NAME: Not applicable (blend)
GENERAL USE: Pesticide
PRODUCT DESCRIPTION: Amber liquid
EPA Registration Number: Not registered in U.S. For Export Only.
MSDS No.: 320_2
Revision Date: 31 January, 2007



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. |
|---|---------------|---------|
| Dimethyl 2,2-dichlorovinylphosphate (DDVP) | 75.2% | 62-73-7 |
| Inert ingredients | 24.8% | |
| Includes 1,2-benzenedicarboxylic acid, dibutyl ester (Dibutyl phthalate) | 17.3% | 84-74-2 |

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)

| COMPONENT | HAZARD | OSHA PEL* | ACGIH TLV* |
|-----------------------------|----------------|-----------------------|-----------------------|
| DDVP (62-73-7) | POISON | 1.0 mg/m ³ | 0.1 mg/m ³ |
| Dibutyl phthalate (84-74-2) | CNS Depression | 5.0 mg/m ³ | 5.0 mg/m ³ |

* Exposure Limits 8 hrs. TWA

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3. **HAZARDS IDENTIFICATION**

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.

CAUTION! COMBUSTIBLE! 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 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. It should also be noted that because of the presence of the solvent, the product is irritating to the skin and eyes and may cause central nervous system depression.

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 damage.

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). **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.

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.

4. FIRST AID MEASURES, cont'd

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. Activated charcoal is useful to further limit absorption.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point: ca 194°F/90°C (Pensky-Martens c.c.)

Autoignition Temperature: Not available

Flammable Limits:

Lower flammable limit: not available

Upper flammable limit: not available

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

EXPLOSIVITY

Mechanical Impact: Will not occur

Static Discharge: Not likely to occur

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).

5. FIRE FIGHTING MEASURES, cont'd

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 appropriate personal protective equipment (PPE, Section 8). 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 NUVAN® 1000 EC. Use of mechanical or local exhaust systems is recommended. See label or contact your distributor for more complete instructions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION, cont'd

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: Prevent skin contact. Chemical resistant gloves (preferably nitrile), coveralls or long-sleeved shirt and pants, and chemical resistant shoes or boots, are necessary to prevent skin contamination. A chemical resistant apron or chemical resistant clothing will provide additional protection when there is a risk of spillage or splashing. Remove contaminated clothing as soon as possible. Wash dirty or contaminated clothing separately from other clothes. Wear clean clothes daily. Wash well with soap and water after handling this product. See the label for more specific instructions.

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.

OTHER PROTECTION: An eyewash station and a safety shower should be located in the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|-------------------------------------|--|
| PHYSICAL STATE: | Liquid |
| APPEARANCE: | Amber liquid |
| ODOR: | Solvent odor |
| ODOR THRESHOLD: | Not available |
| BOILING POINT: | > 626°F/330°C |
| FREEZING/MELTING POINT: | < 14°F/-10°C |
| SPECIFIC GRAVITY: | 1.31 to 1.33 g/mL (20°C) |
| BULK DENSITY: | 10.93 to 11.10 lb/gal |
| VAPOR PRESSURE (mm/hg): | Not available |
| VAPOR DENSITY: | Heavier than air |
| PERCENT VOLATILE BY VOL: | Not available |
| SOLUBILITY IN WATER: | Emulsifies |
| SOLUBILITY (Other): | Soluble in acetone and alcohols |
| PARTITION COEFFICIENT (O/W): | Not available |
| pH (1% emulsion in water): | 3 to 5 |
| EVAPORATION RATE: | 0.1 (compared to –Butyl acetate = 1.0) |

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. 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.

HAZARDOUS POLYMERIZATION: This product will not polymerize.

11. TOXICOLOGICAL INFORMATION

| | | |
|-----------------------|-------------------------------------|-------------------------|
| INGESTION: | Oral LD ₅₀ (rat): | 80 mg/kg |
| INHALATION: | Inhalation LC ₅₀ (rat): | 0.45 mg/L (4 hr, vapor) |
| DERMAL: | Skin LD ₅₀ (rabbit): | 74 mg/kg |
| IRRITATION: | Eye irritation: | Irritant |
| | Skin irritation: | Irritant |
| SENSITIZATION: | Skin sensitization: (guinea pig) | Probable Sensitizer |

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 activity 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)

REPRODUCTIVE TOXICITY: Reproductive effects with DDVP Technical have only been seen at a dose level which produced a generalized toxicity in the rat. There have been reproductive effects observed in laboratory animal studies run with Dibutyl phthalate. The relevance to humans is uncertain.

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.

ACUTE TOXICITY TO FISH: LC₅₀ (trout) 0.96 mL/L (96 hr)

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.

14. TRANSPORTATION INFORMATION

| | |
|--|---|
| DOT CLASS: | 6.1 |
| UN NUMBER: | 3018 |
| 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, (Dichlorvos) |
| REPORTABLE QUANTITY: (DOT, 172.101, Appendix A) | Yes |

PACKAGING

| | |
|-----------------------------|------------|
| GENERAL DESCRIPTION: | 200 L Drum |
|-----------------------------|------------|

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. 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) 75.2 %; Dibutyl phthalate (84-74-2) - 17.3%

CERCLA Reportable Quantities (RQ): DDVP - 10 lbs; Dibutyl phthalate - 10 lbs
Product - 13.3 lbs

STATE REGULATIONS:

CALIFORNIA (Proposition 65): This product contains a chemical known to the State of California to cause cancer - DDVP (Dichlorvos).

16. OTHER INFORMATION

MSDS Status:

Date This Revision: 31 January, 2007

Date Previous Revision: 10 February 2004

Person Responsible for Preparation: Gary A. Braden

Reasons for Revision: Information was updated in section 11 to reflect current toxicological data on this product.

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.