



DuPont
Material Safety Data Sheet

Page 1

M0000394 "BENLATE" SP FUNGICIDE - NON-CA USE ONLY
Revised 16-DEC-1996 Printed 10-JAN-1997

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"BENLATE" is a registered trademark of DuPont.

Corporate MSDS Number : DU008258

Product Use

FOR SALE AND USE IN STATES OTHER THAN CALIFORNIA

Company Identification

MANUFACTURER/DISTRIBUTOR
DuPont
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS

Product Information : 1-800-441-7515
Transport Emergency : CHEMTREC 1-800-424-9300
Medical Emergency : 1-800-441-3637

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
*BENOMYL (METHYL 1-(BUTYLCARBAMOYL)-2- BENZIMIDAZOLECARBAMATE)	17804-35-2	50
INERT INGREDIENTS		50

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

HAZARDS IDENTIFICATION

Potential Health Effects

CAUTION! May irritate eyes, nose, throat and skin.

ROUTES OF EXPOSURES AND EFFECTS

INGESTION

LD50: > 10,000 mg/kg (fasted rats). Very low toxicity.

(HAZARDS IDENTIFICATION - Continued)

INHALATION

4-hour LC50: > 4.01 mg/L (rat). Low to moderately toxic.

DERMAL CONTACT

LD50: > 10,000 mg/kg (rabbit). Very low toxicity by contact.

DERMAL IRRITATION AND SENSITIZATION

Application to shaved skin of male guinea pigs with formulated product (in distilled water) produced moderate sensitization. Tests for dermal irritation produced none to mild responses.

Repeated exposure to this product may cause a temporary allergic skin reaction in a few susceptible persons. This condition should be treated as an allergic contact dermatitis. There is no evidence of persistent effects or permanent injury.

EYE IRRITATION

(Rabbit): 10 to 27 mg of dry 50% formulation or 0.1 ml of 10% suspension in mineral oil caused only temporary mild conjunctival irritation.

CHRONIC STUDIES - BENOMYL

FEEDING STUDIES (Rat, Dog and Mouse)

In two-year feeding studies (with 2,500 ppm, the highest dietary level), the no observable effect level (NOEL) was 2,500 ppm for rats and 500 ppm for dogs. In dogs fed 2,500 ppm, there was biochemical evidence of impaired liver function and histological evidence of liver cirrhosis. No oncogenic effects were observed in rats.

In a two-year feeding study with mice, the NOEL was 500 ppm except for changes in the liver. This NOEL was based on reduced body weights, weight effects in the liver and testes and microscopic changes in these tissues at 1,500 and 5,000 ppm. Oncogenic effects were observed in the liver of male and female mice at all dietary levels (500 to 5,000 ppm). Other studies with the active metabolite of benomyl in similar mouse strains produced similar results; however, oncogenicity was not observed at exposures below 500 ppm. When an unrelated strain of mice was used, i.e., one with a much lower background liver tumor incidence among untreated animals, an oncogenic response was not produced. This was true for exposures up to and including 5,000 ppm.

(HAZARDS IDENTIFICATION - Continued)

TERATOGENICITY (Rat, Rabbit)

Benomyl was not embryotoxic or teratogenic to rats by dietary administration at levels as high as 5,000 ppm (equivalent to approximately 373 mg/kg/day). No teratogenic effects were found in studies with rabbits fed 500 ppm in the diet (equivalent to approximately 20 mg/kg/day). By gavage administration, a statistically significant teratogenic response was obtained at dose levels of 62.5 mg/kg/day and above, but not at 30 mg/kg/day and below.

MUTAGENICITY/GENOTOXICITY

Benomyl has been evaluated in numerous tests for mutagenicity and genotoxicity. The vast majority of these tests were negative. The weight of evidence from all studies indicates that benomyl is not a heritable gene mutagen. It does not interact with cellular DNA, induce point or germ cell mutations. Benomyl is not considered clastogenic. The only genotoxic endpoint for which benomyl produces specific responses is numerical chromosome aberrations or aneuploidy. This is the mechanism by which benomyl exerts its fungicidal activity.

REPRODUCTIVE TOXICITY

Excessive exposures of laboratory animals to benomyl has reduced testicular weight, lowered sperm counts and reduced fertility. These effects were accompanied by other indicators of general toxicity and were reversible in tests that evaluated effects after exposure was discontinued.

In 2- and 3-generation dietary studies in rats the overall NOELs for parents and their offspring was 500 ppm (20-30 mg/kg/day). Reduced body weights, testicular weights and sperm counts were observed at 3,000 and 10,000 ppm. However, there were no compound-related effects on fertility, mating behavior or gestation length. Benomyl is not considered to have selective effects on the reproductive system. The effects occur at doses that also produce general toxicity in the laboratory animals.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

INHALATION

No specific intervention is indicated as the compound is not likely to be hazardous by inhalation. Consult a physician if necessary.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

No specific intervention is indicated as compound is not likely to be hazardous by ingestion. Consult a physician if necessary.

SKIN CONTACT

In case of contact, flush skin with plenty of water.

This product may cause a temporary allergic skin reaction in a few susceptible persons. This condition should be treated as an allergic dermatitis. There is no evidence of after effects or permanent injury.

FIRE FIGHTING MEASURES

Flammable Properties

May be ignited by heat or open flame.

Flammable solid. Like most organic powders or crystals, under severe dusting conditions, this material may form explosive mixtures in air.

Hazardous gases/vapors produced in fire are n-butylisocyanate.

Extinguishing Media

Water Spray, Dry Chemical.

Fire Fighting Instructions

Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment. Use water spray. Runoff from fire control may be a pollution hazard.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean Up

Shovel or sweep up.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors or mist. Avoid breathing dust. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material.

USERS SHOULD: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Remove personal protective equipment immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Handling (Physical Aspects)

Avoid dust generation. Keep away from heat, sparks and flames.

Storage

Do not allow material to become wet during storage.

Store in a well ventilated place. Store product in original container only. Keep container tightly closed. Provide storage with automatic extinguishing system. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material.

This product should be segregated from flammable gases and flammable liquids by at least 10 ft. during warehouse storage.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use only with adequate ventilation.

Personal Protective Equipment

Handlers who may be exposed to the dilute through application or other tasks must wear:

Long-sleeved shirt and long pants.
Waterproof gloves and chemical-resistant footwear plus socks.
Chemical-resistant apron when cleaning equipment.

Handlers who may be exposed to the concentrate through mixing, loading, application, or other tasks must wear:

Long-sleeved shirt and long pants.
Waterproof gloves and chemical-resistant footwear plus socks.
Chemical-resistant apron when mixing or loading.

For exposures in enclosed areas, a respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

For exposures outdoors, a dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C).

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

Exposure Guidelines

Applicable Exposure Limits

BENOMYL
PEL (OSHA) : 15 mg/m³, total dust, 8 Hr. TWA
5 mg/m³, respirable dust, 8 Hr. TWA
TLV (ACGIH) : 0.84 ppm, 10 mg/m³, 8 Hr. TWA, A4
AEL * (DuPont) : 5 mg/m³, total dust, 8 & 12 Hr. TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Odor : None
Form : Wettable powder in water soluble packets.
Color : Off-white
Bulk Density (Loose) : 24 lb/cu ft

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Moisture will cause breakage of inner bag.

Incompatibility with Other Materials

None reasonably foreseeable.

Decomposition

Decomposes with heat.

Hazardous gases/vapors produced are n-butylisocyanate, a strong lachrymator. High humidity or moisture levels and/or high temperatures can also lead to the generation of n-butyl isocyanate.

Polymerization

Polymerization will not occur.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Aquatic Toxicity

Benomyl

96 hour LC50, rainbow trout: 0.41 ppm

DISPOSAL CONSIDERATIONS

Waste Disposal

Do not contaminate water supply, food or feed by storage or disposal. Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Environmental Hazards

This pesticide is toxic to fish. For terrestrial uses, do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark, except for the registered aquatic use on rice. Do not apply where runoff is likely to occur. Drift and runoff from treated areas may be hazardous to fish in adjacent areas. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift from areas treated.

Container Disposal

Completely empty contents of envelope into application equipment. Then dispose of empty envelope in a sanitary landfill, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO
Proper Shipping Name : FLAMMABLE SOLID, ORGANIC, N.O.S.
(benomyl)
Hazard Class : 4.1
UN No. : UN 1325
DOT/IMO Label : FLAMMABLE SOLID
Special Information : MARINE POLLUTANT (water or bulk)
Packing Group : III

REGULATORY INFORMATION

U.S. Federal Regulations

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : Yes
Fire : Yes

(REGULATORY INFORMATION - Continued)

Reactivity : No
Pressure : No

In the United States this product is regulated by the US Environmental Protection Agency under the Federal Insecticide, Fungicide and Rodenticide Act. It is a violation of federal law to use this product in a manner inconsistent with its labeling.

EPA Reg. No. 352-564

Reportable Quantity (Superfund) = 1 lb. (as Benomyl)

OTHER INFORMATION

NFPA, NPCA-HMIS

NFPA Rating
Health : 1
Flammability : 2
Reactivity : 0

NPCA-HMIS Rating
Health : 1
Flammability : 2
Reactivity : 0

Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : DuPont Company
Agricultural Products
Address : Wilmington, Delaware 19898
Telephone : 800-441-7515

End of MSDS