



The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

DuPont
Material Safety Data Sheet

Page 1

"BIOMAX" BIOPOLYMER RESIN ALL IN SYNONYM LIST BIOS008
BIOS008 Revised 11-APR-2008

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"BIOMAX" is a registered trademark of DuPont.

Tradenames and Synonyms

"DUPONT" "BIOMAX" TPS2001 XXXNL
"DUPONT" "BIOMAX" TPS2001 XXXBK
"DUPONT" "BIOMAX" TPS2001 XXXWH
WHERE XXX CAN BE ANY NUMBER

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont Packaging & Industrial Polymers
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS

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

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
MODIFIED STARCH		<90
PROCESS AIDS AND MODIFIERS		<15
TITANIUM DIOXIDE (FOR WHITE GRADE)	13463-67-7	<1.2
METHANOL	67-56-1	<0.2

HAZARDS IDENTIFICATION

Potential Health Effects

ACUTE OR IMMEDIATE EFFECTS: ROUTES OF ENTRY AND SYMPTOMS

INGESTION Not a probable route of entry. Toxicity is predicted to be low.

SKIN Based on experience with handling these polymers and others which are similar chemically, no unusual dermatitis hazard is expected from routine handling.

EYE Mechanical irritation only.

(HAZARDS IDENTIFICATION - Continued)

INHALATION Under certain conditions of use of "DUPONT" "BIOMAX" TPS2001, dust may be formed. Treat this dust as a nuisance dust; use a dust mask if dust exceeds the recommended limits. "DUPONT" "BIOMAX" TPS2001 is rarely heated above 150 degrees C (300 degrees F). If the temperature exceeds 200 degrees C, fumes irritating to the eyes, nose, and throat will be evolved. If exposed to these fumes, the eyes will tear, itch, and turn red. The nose will burn. The throat will burn and coughing may result.

CHRONIC EFFECTS None are known.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE None are known.

TITANIUM DIOXIDE

Short-term overexposure by inhalation to Titanium Dioxide may cause irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath.

Repeated skin contact with Titanium Dioxide may cause drying or cracking of the skin in sensitive individuals.

Eye contact with Titanium Dioxide may cause eye irritation with tearing, pain or blurred vision.

Results of a DuPont epidemiology study showed that employees who had been exposed to Titanium Dioxide were at no greater risk of developing lung cancer than were employees who had not been exposed to Titanium Dioxide. No pulmonary fibrosis was found in any of the employees and no association was observed between Titanium Dioxide exposure and chronic respiratory disease or x-ray abnormalities. Based on the results of this study, DuPont concludes that Titanium Dioxide will not cause lung cancer or chronic respiratory disease in humans at concentrations experienced in the workplace.

METHANOL

The fatal dose of Methyl Alcohol by ingestion is from 60 to 250 ml.

Inhalation of Methyl Alcohol may cause irritation of the nose and throat with sneezing, sore throat or runny nose.

Skin contact with Methyl Alcohol may cause irritation with itching, burning, redness, swelling or rash. Skin permeation may occur in amounts capable of producing the effects of systemic toxicity.

Eye contact with Methyl Alcohol may cause eye irritation with tearing, pain or blurred vision.

(HAZARDS IDENTIFICATION - Continued)

Ingestion of Methyl Alcohol may cause irritation of the digestive tract with stomach pain, heartburn, nausea, vomiting or diarrhea; however there may be no symptoms at all.

Inhalation, ingestion or skin contact with Methyl Alcohol may cause temporary mild depression of the central nervous system with dizziness, confusion, incoordination or drowsiness followed by an asymptomatic period usually ranging from 12 to 24 hours. Metabolic acidosis develops followed by ocular toxicity (visual disturbance including blindness). Other effects include non-specific effects such as headache, nausea and weakness. Gross overexposure may cause pathological changes in the liver and kidneys; nerve damage with numbness, weakness or muscle rigidity; tremors; convulsions; and fatality.

Increased susceptibility to the effects of Methyl Alcohol may be observed in persons with pre-existing disease of the nervous system, visual system, liver, kidneys, and cardiovascular system.

Carcinogenicity Information

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

Material TITANIUM DIOXIDE (FOR WHITE GRADE)	IARC NTP OSHA ACGIH 2B
--	---------------------------

FIRST AID MEASURES

First Aid

INHALATION

If exposed to fumes from overheating or combustion, move to fresh air. Consult a physician if symptoms persist.

SKIN CONTACT

In case of contact, immediately wash skin with soap and water. Wash contaminated clothing before reuse. If molten material gets on skin, cool rapidly with cold water. Do not attempt to remove material from skin. Obtain medical treatment for thermal burn.

EYE CONTACT

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

FIRE FIGHTING MEASURES

Flammable Properties

Flash Ignition Temperature: No Data Available

Fire and Explosion Hazards:

The solid polymer can be combusted only with difficulty. Dust from "DUPONT" "BIOMAX" TPS2001 can form an explosive mixture in the air. Information about special precautions needed for bulk handling is available upon request.

HAZARDOUS COMBUSTION PRODUCTS Complete combustion gives carbon dioxide and water. Incomplete combustion gives, in addition, carbon monoxide and hydrocarbon oxidation products including organic acids, aldehydes and alcohols, oxides of sodium.

Extinguishing Media

Water, CO2, Foam.

Fire Fighting Instructions

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

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.

Spill Clean Up

Sweep up pellets or sheet to avoid slipping hazard.

HANDLING AND STORAGE

Handling (Personnel)

See FIRST AID and PERSONAL PROTECTIVE EQUIPMENT SECTIONS.

Storage

Store in a cool, dry place. Keep containers tightly closed to prevent moisture absorption and contamination.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

In the event the polymer is heated above 200 C (392 F), local ventilation should be used to avoid exposure to fumes. Use ventilation to avoid exposure of personnel to dust.

Personal Protective Equipment

EYE/FACE PROTECTION

Wear safety glasses. Wear coverall chemical splash goggles and face shield when possibility exists for eye and face contact due to splashing or spraying of molten material. A full face mask respirator provides protection from eye irritation.

RESPIRATORS

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge with a dust/mist filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

PROTECTIVE CLOTHING

If there is potential contact with hot/molten material, wear heat resistant clothing and footwear.

Exposure Guidelines

Exposure Limits

"BIOMAX" BIOPOLYMER RESIN ALL IN SYNONYM LIST BIOS008

PEL (OSHA) : Particulates (Not Otherwise Regulated)
15 mg/m³, 8 Hr. TWA, total dust
5 mg/m³, 8 Hr. TWA, respirable dust

Other Applicable Exposure Limits

TITANIUM DIOXIDE (FOR WHITE GRADE)

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

METHANOL

(Other Applicable Exposure Limits - Continued)

PEL (OSHA) : 200 ppm, 260 mg/m3, 8 Hr. TWA
TLV (ACGIH) : 200 ppm, 8 Hr. TWA, Skin
 STEL 250 ppm
AEL * (DuPont) : 200 ppm, 8 & 12 Hr. TWA, Skin

* 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

% Volatiles : <15 WT% (predominantly water)
Solubility in Water : Will swell in water at room temperature.
Odor : Mild
Form : Solid
Color : Clear or pigmented
Specific Gravity : 1.3-1.5

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Conditions to Avoid

Temperatures above 150 C (302 F) .

Incompatibility with Other Materials

None reasonably foreseeable.

Decomposition

HAZARDOUS DECOMPOSITION PRODUCTS - carbon monoxide and hydrocarbon oxidation products including organic acids, aldehydes and alcohols, oxides of sodium.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

Titanium Dioxide

Oral ALD: > 24,000 mg/kg in rats
Dermal ALD: > 10,000 mg/kg in rabbits
Inhalation 4 hour ALC: > 6.82 mg/L in rats

Animal testing indicates Titanium Dioxide is a moderate eye irritant and a slight skin irritant, but is not a skin sensitizer in animals.

Repeated and long term ingestion of Titanium Dioxide caused no significant toxicological effects.

Repeated exposure by inhalation to high doses of Titanium Dioxide caused a typical dust cell reaction.

In lifetime inhalation studies at levels up to 250 mg/m³, no compound-related clinical signs of toxicity were seen in the exposed animals. Slight pulmonary fibrosis was seen at 50 and 250 mg/m³ respirable dust levels but not at 10 mg/m³. There was no evidence of cancer in animals exposed to 10 or 50 mg/m³ respirable Titanium Dioxide. Microscopic lung tumors were seen in 17 percent of the rats exposed to 250 mg/m³ respirable Titanium Dioxide. The lung tumors seen in the rat were different from common human lung cancers, relative to anatomic type and location, occurred only at dust levels which overwhelmed the animals lung clearance mechanism and, therefore, are of questionable biological relevance for man. In lifetime animal feeding tests at levels up to 50,000 ppm, Titanium Dioxide showed no evidence of cancer or other significant adverse effects in either rats or mice. No animal data are available to define the developmental or reproductive toxicity of Titanium Dioxide. Tests have shown that Titanium Dioxide does not cause genetic damage in bacterial or mammalian cell cultures, or in animals.

METHANOL

Methyl Alcohol

Oral LD50: 9,100 mg/kg in rats
Dermal LD50 15,840 mg/kg in rabbits
Inhalation 1 hour LC50: > 145,000 ppm in rats

Animal testing indicates Methyl Alcohol is an eye and skin irritant.

Eye contact with Methyl Alcohol caused clouding of the eye (corneal opacity).

Repeated skin contact with higher concentrations of Methyl Alcohol caused some mortality.

(TOXICOLOGICAL INFORMATION - Continued)

Single exposure by ingestion caused narcosis, liver effects, and hypothermia. Repeated exposure caused pathological changes of the eyes and acidosis.

Repeated exposure by inhalation caused irritation of the eyes, and blindness.

No animal data are available to define the carcinogenicity of Methyl Alcohol. Exposure of pregnant rats shows the following developmental effects: reduced birth weight, bone abnormalities, and behavioral abnormalities. Exposure of pregnant mice shows the following developmental effects: reduced birth weight, resorption, and bone abnormalities. No adequate animal data are available to define the reproductive effects of Methyl Alcohol. Tests have shown that Methyl Alcohol does not cause genetic damage in bacterial or mammalian cell cultures, or in animals. Methyl Alcohol has not been tested for its ability to cause permanent genetic damage in reproductive cells of mammals (not tested for heritable genetic damage).

ECOLOGICAL INFORMATION

Ecotoxicological Information

AQUATIC TOXICITY:

No data is available. Toxicity is expected to be low. Do not discharge into streams, ponds, lakes, or sewers.

DISPOSAL CONSIDERATIONS

Waste Disposal

Preferred options for disposal are (1) recycling, (2) incineration with energy recovery, and (3) landfill. The high fuel value of this product makes option 2 very desirable for material that cannot be recycled. Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state/provincial, and local regulations.

TRANSPORTATION INFORMATION

Shipping Information

DOT
Proper Shipping Name : Not applicable
Hazard Class : Not regulated

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : In compliance with TSCA Inventory requirements for commercial purposes.

State Regulations (U.S.)

STATE RIGHT-TO-KNOW

No substances on the state hazardous substances list, for the states indicated below, are used in the manufacture of products on this Material Safety Data Sheet, with the exceptions indicated.

SUBSTANCES ON THE PENNSYLVANIA HAZARDOUS SUBSTANCES LIST PRESENT AT A CONCENTRATION OF 1 % OR MORE (0.01% FOR SPECIAL HAZARDOUS SUBSTANCES)- Titanium Dioxide (for White grade).

WARNING - SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM - Acetaldehyde, Ethylene oxide, Formaldehyde, Hydrazine, and 1,4-dioxane.

SUBSTANCES ON THE NEW JERSEY WORKPLACE HAZARDOUS SUBSTANCE LIST PRESENT AT A CONCENTRATION OF 1% OR MORE (0.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS) - Titanium Dioxide (for White grade).

OTHER INFORMATION

NFPA, NPCA-HMIS

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

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

Additional Information

MEDICAL USE: CAUTION: Do not use in medical applications involving permanent implantation in the human body. "BIOMAX" is intended for industrial use and is expressly not for use in cosmetic, personal care and pharmaceutical or similar applications. For other medical applications see DuPont CAUTION Bulletin No. H-50102.

(Continued)

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 : S. C. FEINBERG
DUPONT PACKAGING & INDUSTRIAL POLYMERS
Address : CHESTNUT RUN PLAZA 713
WILMINGTON, DE 19880-0713
Telephone : 302-999-4124

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS