PmB Blueshield 0308/0309
Application Guide

Bayer MaterialScience

Scope

This document defines all of the material, equipment and processing parameters that must be followed to successfully spray the PmB Blueshield 0308/0309 bridge deck waterproofing system as specified.

Material Requirements

The PmB Blueshield 0308/0309 bridge deck waterproofing system must be stored in tightly closed containers between 60ºF and 95ºF prior to use. Any partially filled containers should be blanketed with dry nitrogen before resealing.

Before spraying the PmB Blueshield 0308/0309 system, both the Isocyanate and Polyol components must be pre-heated to a minimum temperature of 80ºF in the drums. This can be accomplished through the use of band style heaters, torpedo heaters or recirculation if your machine is capable of recirculation back into the drums.

The temperature can be measured by pointing an IR thermometer at the bottom third of the drums.

The Polyol component must be pre-mixed prior to use with a 1.5 horsepower, bung mounted mixer with at least two sets of collapsible blades for a minimum of 20 minutes to reincorporate the blue pigment.

The Isocyanate component must not be allowed to freeze. Exposure to temperatures less than 60ºF, even for short periods of time, can result in the formation of solid material.

A desiccant cartridge must be inserted into the small bunghole of both drums to reduce exposure to atmospheric moisture during the application process.

Equipment Requirements

PmB Blueshield 0308/0309 is a fast-set, hybrid system with a mix ratio of one-to-one by volume. It shall only be applied using the following approved plural component equipment.

- Gusmer 20/35
- Graco H-XP2 or E-XP2
- Glas Craft MH or MH III

These machines must be outfitted with 2:1 or 5:1 pneumatic feed pumps.
Diaphragm pumps must not be used to transfer material from the drums to the machine.

All safety, calibration, processing, equipment troubleshooting and routine maintenance guidelines set forth by the equipment manufacturer should be followed at all times.

Warning: Any machine previously used exclusively for spraying foam systems must not be used to process the PmB Blueshield 0308/0309. The higher fluid pressures needed to process the elastomer can break apart crystallized isocyanate deposits on the inside surface of the isocyanate hose of a dedicated foam machine. This can result in repeated blockages at the gun that could compromise operator safety and material quality.

Spray Gun Requirements

PmB Blueshield 0308/0309 shall only be sprayed using the following approved spray guns;

- Graco Fusion MP or AP
- Gusmer GX-7 DI* (*Only the DI model of this gun should be used)
- Probler P2 (Only if outfitted with Flat Spray Kit 23976-00)

The Graco Fusion AP should be outfitted with the AR 3333 or the AR 3737 impingement module.

The Graco Fusion MP should be outfitted with the XF 3535 flat-pattern, direct impingement module and the FTM 638 ceramic spray tip.

The Graco / Gusmer GX7 DI should be set up with the part number 296901 (#4) flat pattern module kit with part number 296700 (#204) fan tip.

The Probler P2 must be set up with an 01 module and a Flat Spray kit (part number 23976-00) in combination with a tungsten carbide airless tip (part number LPA2-147-3640).

Caution: If the Probler P2 air purge gun is used, the air supply to the gun must be capable of providing a minimum of 15 cfm at 100 psi and be outfitted with a fully functioning in-line desiccant and oil trap to ensure that it is completely dry and free of oils.

Processing Requirements

To ensure proper mix of the PmB Blueshield 0308/0309 using any of the approved guns and metering machines, a minimum dynamic fluid pressure of 2200 psi at the gun is required for both the Isocyanate and the Polyol.

Pressure drop between the machine and gun can be significant with hose lengths greater than 100 feet. If pressure gages are not available at the gun, set dynamic fluid pressures at the machine to be 2500 psi to compensate for any drop.

Block and line temperatures on the machine must be set to a minimum of 150°F (65°C) and a maximum of 175°F (80°C) to ensure that the viscosity is low enough for the mixing module in the gun to work as designed. Each side can be individually set within this range to balance the viscosities if necessary.

The dynamic fluid pressures must never diverge more than 10% during the spraying process.

It is always good practice to ensure that the system is processing well by spraying one or two test panels each day before beginning the coating job. HDPE cookie sheets or cutting boards make excellent test panel substrates.

It is also good practice to keep a detailed daily log of equipment used, machine settings and readings and ambient conditions when on the jobsite. Each test panel should be referenced to a daily log entry.

Ambient Condition Requirements

The PmB Blueshield 0308/0309 bridge deck waterproofing system shall only be sprayed when all of the following ambient conditions are met;

a. The substrate or surface to be sprayed is dry
b. The substrate surface temperature is at least 40°F
c. The substrate surface temperature is at least 5°F greater than the dew point
d. The dew point is less than 65°F
e. The relative humidity is less than 85%
f. The ambient air temperature is at least 32°F

BaySystems
customized polyurethanes

BaySystems North America
100 Bayer Road
Pittsburgh, PA 15205-9741

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Bayer MaterialScience

PmB Blueshield 0308/0309

Product Data Sheet

1. Product Name

- PmB Blueshield 0308/0309

2. Manufacturer

- Bayer Material Science LLC
  100 Bayer Rd.
  Pittsburgh, PA 15205-9741

3. Product Description

- PmB Blueshield 0308/0309 is a 100% solids, two component polyurethane-urea hybrid coating for bridge deck waterproofing, secondary containment, industrial wastewater infrastructure and concrete protection.

4. Features / Benefits

- Fast Cure – Can be walked on in 30 seconds
- Water Proof – Prevents penetration of water
- Flexible – For long term crack and impact resistance
- Durable – High tensile strength, chemical resistance and abrasion resistant.
- Labor Savings – Required millage can be applied in one coat
- Adhesion – Excellent adhesion to most surfaces.
- Thermal Stability – From -30°F to 230°F
- Environmentally Friendly – Zero VOC

5. Typical Properties: (at 75°F)

Color	Blue
Tensile Strength (ASTM D412)	1950 psi
Elongation (ASTM D412)	360%
Hardness	87A
Die C Tear (ASTM D624)	240 pli
180° Peel Test	12.5 pli
Water Vapor Transmission	0.06 perm-in.
Percent Solids	100%
Gel Time	10 seconds
Tack Free	1 minute
Iso Viscosity	2500 cps
Polyol Viscosity	2000 cps

6. Installation

- PmB Blueshield 0308/0309 can be sprayed using both high and low pressure spray equipment.

  For detailed application and processing instructions, please consult the PmB Blueshield 0308/0309 Application Guide

7. Limitations and Precautions

- Ratio of Component A to Component B is 100 : 100 by volume.
- For proper application, it is essential to use approved plural component equipment.
- Both components are sensitive to moisture and must be protected from contamination during storage.
- Materials must never be stored in direct sunlight or allowed to freeze.
- All health and safety precautions must be observed when handling these materials. Consult application guides and MSD sheets

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PmB Blueshield 0308/0309

MATERIAL SAFETY DATA SHEET

Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
100 Bayer Road
Pittsburgh, PA 15205-9741
USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC:	(800) 424-9300
INTERNATIONAL:	(703) 527-3887

NON-TRANSPORTATION

Emergency Phone:	Call Chemtrec
Information Phone:	(800) 662-2927

1. Product and Company Identification

Product Name:	PMB BLUESHIELD 0308
Material Number:	6688470
Chemical Family:	Polyol System

2. Hazards Identification

Emergency Overview

Warning Color: Blue **Form:** liquid **Odor:** ammoniacal.
Harmful by inhalation, in contact with skin and if swallowed. Inhalation, skin absorption, or ingestion may cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of skin, fingernails, and lips). Toxic gases/fumes may be given off during burning or thermal decomposition. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. May cause respiratory tract irritation. May cause skin irritation. May cause allergic skin reaction. Causes eye irritation. May cause a temporary fogging of the eyes. May cause liver damage.

Potential Health Effects

Primary Routes of Entry: Skin Contact, Eye Contact

Medical Conditions Aggravated by Exposure: Eye disorders, Respiratory disorders, Skin disorders

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation
Acute Inhalation
For Component: Diethyltoluenediamine (DETDA)
May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). Inhalation is unlikely due to the low vapor pressure. If misted or handled at elevated temperatures, high concentrations may cause respiratory tract irritation.

For Component: Isophorone Diamine (IPDA)

Inhalation is unlikely due to the low vapor pressure. If misted or handled at elevated temperatures, high concentrations may cause respiratory tract irritation. May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest. Corrosive with symptoms of coughing, burning, ulceration, and pain.

For Component: Tertiary Amine
Inhalation is unlikely due to the low vapor pressure. If misted or handled at elevated temperatures, high concentrations may cause respiratory tract irritation.

For Component: Diethyltoluenediamine (DETDA)
May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). Inhalation is unlikely due to the low vapor pressure. If misted or handled at elevated temperatures, high concentrations may cause respiratory tract irritation.

For Component: Triethylenediamine (TEDA)
Inhalation is unlikely due to the low vapor pressure. If misted or handled at elevated temperatures, high concentrations may cause respiratory tract irritation.

Chronic Inhalation
For Component: Diethyltoluenediamine (DETDA)
May cause liver damage.

For Component: Diethyltoluenediamine (DETDA)
May cause liver damage.

Skin
Acute Skin
For Component: Diethyltoluenediamine (DETDA)
May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). If sufficient amounts are absorbed, systemic toxicity may occur with symptoms similar to those described in acute inhalation.

For Component: Isophorone Diamine (IPDA)
Moderately toxic by skin absorption. Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage. May cause allergic skin reaction with symptoms of reddening, itching, swelling, and rash.

For Component: Tertiary Amine
Causes irritation with symptoms of reddening, itching, and swelling.

For Component: Diethyltoluenediamine (DETDA)
May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). If sufficient amounts are absorbed, systemic toxicity may occur with symptoms similar to those described in acute inhalation.

For Component: Triethylenediamine (TEDA)
Causes irritation with symptoms of reddening, itching, and swelling.

Eye
Acute Eye
For Component: Diethyltoluenediamine (DETDA)
Causes irritation with symptoms of reddening, tearing, stinging, and swelling.

For Component: Isophorone Diamine (IPDA)

Corrosive with symptoms of reddening, tearing, swelling, burning and possible permanent damage.

For Component: Tertiary Amine
Causes irritation with symptoms of reddening, tearing, stinging, and swelling. Vapors can cause temporary corneal edema with symptoms of blurred vision or the appearance of halos around bright objects.

For Component: Diethyltoluenediamine (DETDA)
Causes irritation with symptoms of reddening, tearing, stinging, and swelling.

For Component: Triethylenediamine (TEDA)
Causes irritation with symptoms of reddening, tearing, stinging, and swelling. Vapors can cause temporary corneal edema with symptoms of blurred vision or the appearance of halos around bright objects.

Ingestion
Acute Ingestion
For Component: Diethyltoluenediamine (DETDA)
Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea. May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). Harmful if swallowed.

For Component: Isophorone Diamine (IPDA)
Moderately toxic by ingestion. Ingestion and/or vomiting may cause aspiration into the lungs resulting in chemical pneumonitis (inflammation of the lungs). May cause digestive tract burns.

For Component: Tertiary Amine
May be harmful if swallowed. Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea.

For Component: Diethyltoluenediamine (DETDA)
Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea. May cause methemoglobin formation resulting in a reduced ability of the blood to carry oxygen; a symptom of this may be cyanosis (purplish-blue coloring of the skin, fingernails, and lips). Harmful if swallowed.

For Component: Triethylenediamine (TEDA)
May be harmful if swallowed. Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea.

Chronic Ingestion
For Component: Diethyltoluenediamine (DETDA)
May cause liver damage.

For Component: Diethyltoluenediamine (DETDA)
May cause liver damage.

Carcinogenicity:
No Carcinogenic substances as defined by IARC, NTP and/or OSHA

3. Composition/Information on Ingredients

Hazardous components

Weight percent	Components	CAS-No.
7 - 13%	Diethyltoluenediamine (DETDA)	68479-98-1
1 - 5%	Isophorone Diamine (IPDA)	2855-13-2
0.1 - 1%	Tertiary Amine	CAS# is a trade secret

7 - 13%	Diethyltoluenediamine (DETDA)	68479-98-1
0.1 - 1%	Triethylenediamine (TEDA)	280-57-9

4. First aid measures

Eye contact
In case of contact, flush with plenty of water for at least 15 minutes. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Call a physician immediately.

Skin contact
Immediately remove contaminated clothing and shoes. Wash affected areas, including hair, beneath nails and other concealed areas with Polyethylene Glycol 400. Repeat the washing with soap and water. If Polyethylene Glycol 400 is not available, wash immediately with soap and plenty of cold water. Wash clothing and shoes before reuse. Get medical attention.

Inhalation
If inhaled, remove to fresh air. If not breathing, give artificial respiration using a pocket mask type resuscitator. If breathing is difficult, give oxygen. In case of blue discoloration (cyanosis) of skin, lips, or fingernails, give oxygen to breathe. Get medical attention.

Ingestion
If ingested, do not induce vomiting unless directed to do so by medical personnel. Give two glasses of water for dilution. Do not give anything by mouth to an unconscious person. Call a physician.

Notes to physician
Immediately give oxygen if victim turns blue (lips, ears, fingernails). Since reversion of methaemoglobin to haemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need to be treated only by supportive measures.

5. Fire-fighting measures

Suitable extinguishing media: Carbon dioxide (CO2), Dry chemical, Foam, water spray for large fires.

Special Fire Fighting Procedures
Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.

6. Accidental release measures

Spill and Leak Procedures
Remove all sources of ignition, including flames, heat, and sparks. Ventilate area to remove vapors or dust. Evacuate and keep unnecessary people out of spill area. Use appropriate personal protective equipment during clean up. Dike or dam spilled material and control further spillage, if possible. Do not allow spilled material or wash water to enter sewers, surface waters, or groundwater systems. Large spills should be contained and pumped into original or similar containers. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Wash spill area with soap and water. Collect wash water for approved disposal. Notify local health and safety authorities and other appropriate agencies if necessary.

7. Handling and storage

Storage temperature:

minimum:	10 °C (50 °F)
maximum:	50 °C (122 °F)

Storage period
6 Months

Handling/Storage Precautions
Handle in accordance with good industrial hygiene and safety practices. Wash thoroughly after handling. Keep container closed when not in use. Material is hygroscopic and may absorb small amounts of atmospheric moisture. If contamination with isocyanates is suspected, do not reseal containers. Do not get on skin or clothing. Do not get in eyes. Do not breathe vapours or spray mist.

8. Exposure controls/personal protection

Diethyltoluenediamine (DETDA) (68479-98-1)

Bayer Exposure Limit
Time Weighted Average (TWA): 0.02 ppm

Bayer Exposure Limit
Time Weighted Average (TWA): 0.02 ppm

Industrial Hygiene/Ventilation Measures
Use local and general exhaust ventilation to control levels of exposure.

Respiratory protection
The following respirator is recommended if airborne concentrations exceed the appropriate standard/guideline., NIOSH approved, air-purifying respirator with organic vapor cartridges and N-95 filters, Full face-piece is recommended.

Hand protection
Permeation resistant gloves.

Eye protection
Chemical resistant goggles must be worn.

Skin and body protection
Permeation resistant clothing

Additional Protective Measures
Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product.

9. Physical and chemical properties

Form:	liquid
Color:	Blue
Odor:	ammoniacal
pH:	8

Flash point:	> 93.34 °C (200.01 °F)
Specific Gravity:	1.05
Solubility in Water:	Partially soluble
Viscosity, dynamic:	3,800 mPa.s
Bulk density:	1,042 kg/m3

10. Stability and reactivity

Hazardous Reactions
Hazardous polymerisation does not occur.

Stability
Stable

Materials to avoid
Oxidizing agents, Isocyanates

Hazardous decomposition products
By Fire: Carbon Dioxide; Carbon Monoxide; Hydrogen cyanide, nitrogen oxides (NOx), Amines, other aliphatic fragments which have not been determined

11. Toxicological information

Toxicity Data for Polyether Polyol
Toxicity Note
No data available for this component.

Toxicity Data for Polymer
Acute oral toxicity
LD50: 1,000 mg/kg (mouse)
LD50: 1,800 mg/kg (rat)

Acute dermal toxicity
LD50: > 2,000 mg/kg (rabbit)
Estimated Value

Skin irritation
rabbit, non-irritant

Eye irritation
rabbit, non-irritant

Sensitisation
dermal: non-sensitizer (Human)
dermal: non-sensitizer (guinea pig)

Toxicity Data for Diethyltoluenediamine (DETDA)
Acute oral toxicity
LD50: 472 mg/kg (Rat, Female)
LD50: 542 mg/kg (rat, male)

Acute inhalation toxicity
LC50: > 2.45 mg/l, 1 h (Rat)

Acute dermal toxicity
LD50: > 1,000 mg/kg (rabbit)

Skin irritation
rabbit, Non-irritating

Eye irritation
rabbit, irritating

Sensitisation
Maximisation Test: non-sensitizer (guinea pig)

Repeated dose toxicity
21 Days, dermal: NOAEL: 1 mg/kg, (rabbit, Male/Female, daily)
13 Days, inhalation: NOAEL: < 10 mg/l, (Rat,)

Mutagenicity
Genetic Toxicity in Vitro:
Ames: positive (Salmonella typhimurium, Metabolic Activation: with)
Positive and negative results were seen in various in vitro studies.
Genetic Toxicity in Vivo:
Dominant Lethal Assay: (rat, Male/Female, oral)
negative
Cytogenetic assay: (Rat, male, oral)
positive
Micronucleus Assay: (mouse, Male/Female, intraperitoneal)
negative

Carcinogenicity
Rat, Male/Female, oral, 2 years, daily,
positive

Toxicity Data for Isophorone Diamine (IPDA)
Acute dermal toxicity
LD50: 1,800 mg/kg (rabbit)

Skin irritation
rabbit, irritating

Eye irritation
rabbit, OECD Test Guideline 405, Corrosive

Sensitisation
dermal: sensitizer (Human, Patch Test)

Repeated dose toxicity
13 weeks, oral: NOAEL: ca. 60 mg/kg, (Rat, Male/Female, daily)

Mutagenicity
Genetic Toxicity in Vitro:
Ames: Negative results were reported in various in vitro studies. (Salmonella typhimurium, Metabolic Activation: with/without)
Genetic Toxicity in Vivo:
Micronucleus Assay: negative (mouse, Male/Female, oral)
negative

Toxicity Data for Polymer
Acute oral toxicity
LD50: > 5,000 mg/kg (Rat)
Estimated Value

Skin irritation
Slightly irritating

Eye irritation
Slightly irritating

Toxicity Data for Tertiary Amine
Acute inhalation toxicity
LC50: > 20 mg/l, 1 h (rat)

Acute dermal toxicity
LD50: > 2,000 mg/kg (rabbit)

Skin irritation
rabbit, Draize, Mild skin irritation

Eye irritation
rabbit, Draize, Moderately irritating

Toxicity Data for Diethyltoluenediamine (DETDA)
Acute oral toxicity
LD50: 472 mg/kg (Rat, Female)
LD50: 542 mg/kg (rat, male)

Acute inhalation toxicity
LC50: > 2.45 mg/l, 1 h (Rat)

Acute dermal toxicity
LD50: > 1,000 mg/kg (rabbit)

Skin irritation
rabbit, Non-irritating

Eye irritation
rabbit, irritating

Sensitisation
Maximisation Test: non-sensitizer (guinea pig)

Repeated dose toxicity
21 Days, dermal: NOAEL: 1 mg/kg, (rabbit, Male/Female, daily)
13 Days, inhalation: NOAEL: < 10 mg/l, (Rat,)

Mutagenicity
Genetic Toxicity in Vitro:
Ames: positive (Salmonella typhimurium, Metabolic Activation: with)
Positive and negative results were seen in various in vitro studies.
Genetic Toxicity in Vivo:
Dominant Lethal Assay: (rat, Male/Female, oral)
negative
Cytogenetic assay: (Rat, male, oral)
positive

Micronucleus Assay: (mouse, Male/Female, intraperitoneal)
negative

Carcinogenicity
Rat, Male/Female, oral, 2 years, daily,
positive

Toxicity Data for Triethylenediamine (TEDA)
Acute inhalation toxicity
LC50: > 20 mg/l, 1 h (rat)

Acute dermal toxicity
LD50: > 2,000 mg/kg (rabbit)

Skin irritation
rabbit, Draize, Mild skin irritation

Eye irritation
rabbit, Draize, Moderately irritating

12. Ecological information

Ecological Data for Polyether Polyol
Additional Ecotoxicological Remarks
No data available for this component.
Ecological Data for Diethyltoluenediamine (DETDA)
Biodegradation
aerobic, 0 %, Exposure time: 28 Days

Chemical Oxygen Demand (COD)
2,370 mg/g

Acute and Prolonged Toxicity to Fish
LC50: ca. 194 mg/l (Golden orfe (Leuciscus idus), 48 h)

Acute Toxicity to Aquatic Invertebrates
EC50: ca. 0.5 mg/l (Water flea (Daphnia magna), 48 h)

Toxicity to Microorganisms
EC10: 170 mg/l, (Pseudomonas putida, 24 h)

Ecological Data for Isophorone Diamine (IPDA)
Biodegradation
Aerobic, 8 %, Exposure time: 28 Days

Bioaccumulation
Not expected to bio-accumulate.

Acute and Prolonged Toxicity to Fish
LC50: 110 mg/l (Golden orfe (Leuciscus idus), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: 1 - 50 mg/l (Water flea (Daphnia magna), 48 h)

Toxicity to Aquatic Plants
EC50: 37 mg/l, End Point: biomass (Green algae (Scenedesmus subspicatus), 72 h)

Toxicity to Microorganisms
EC10: 1,120 mg/l, (Pseudomonas putida, 18 h)

Ecological Data for Polymer
Acute and Prolonged Toxicity to Fish
LC0: > 100 mg/l (Zebra fish (Brachydanio rerio), 96 h)

Toxicity to Microorganisms
EC50: > 10,000 mg/l, (Activated sludge microorganisms, 3 h)

Ecological Data for Tertiary Amine
Biodegradation
7 %, Exposure time: 28 Days

Acute and Prolonged Toxicity to Fish
LC50: 1,730 mg/l (Fathead minnow (Pimephales promelas), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: 92 mg/l (Water flea (Daphnia magna), 48 h)

Ecological Data for Diethyltoluenediamine (DETDA)
Biodegradation
aerobic, 0 %, Exposure time: 28 Days

Chemical Oxygen Demand (COD)
2,370 mg/g

Acute and Prolonged Toxicity to Fish
LC50: ca. 194 mg/l (Golden orfe (Leuciscus idus), 48 h)

Acute Toxicity to Aquatic Invertebrates
EC50: ca. 0.5 mg/l (Water flea (Daphnia magna), 48 h)

Toxicity to Microorganisms
EC10: 170 mg/l, (Pseudomonas putida, 24 h)

Ecological Data for Triethylenediamine (TEDA)
Biodegradation
7 %, Exposure time: 28 Days

Acute and Prolonged Toxicity to Fish
LC50: 1,730 mg/l (Fathead minnow (Pimephales promelas), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: 92 mg/l (Water flea (Daphnia magna), 48 h)

13. Disposal considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Empty Container Precautions

Recondition or dispose of empty container in accordance with governmental regulations. Do not heat or cut container with electric or gas torch. Empty containers retain product residue (dust, liquid, vapor and/or gases) and can be dangerous.

14. Transport information

Land transport (DOT)
Non-Regulated

Sea transport (IMDG)
Non-Regulated

Air transport (ICAO/IATA)
Non-Regulated

15. Regulatory information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):
Components
None

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):
Components
None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:
Components
None

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):
Under RCRA, it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight percent	Components	CAS-No.
>=1%	Polyether Polyol	9082-00-2
>=1%	Styrene/Acrylonitrile Copolymer (SAN)	9003-54-7
7 - 13%	Diethyltoluenediamine (DETDA)	68479-98-1
>=1%	Polymer	57913-80-1

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

Weight percent	Components	CAS-No.
1 - 5%	Isophorone Diamine (IPDA)	2855-13-2
0.1 - 1%	Zinc Compound(s)	

MA Right to Know Extraordinarily Hazardous Substance List:

Weight percent	Components	CAS-No.
20 - 25 ppm	Acrylonitrile	107-13-1
50 - 55 ppm	Styrene	100-42-5

California Prop. 65:
Warning! This product contains chemical(s) known to the State of California to be Carcinogenic.

Weight percent	Components	CAS-No.
20 - 25 ppm	Acrylonitrile	107-13-1

16. Other information

NFPA 704M Rating

Health	2
Flammability	1
Reactivity	0
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	2*
Flammability	1
Physical Hazard	0

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact person: Product Safety Department
Telephone: (412) 777-2835
MSDS Number: 112000028371
Version Date: 01/15/2010
Report version: 1.7

This information is furnished without warranty, express or implied. This information is believed to be accurate to the best knowledge of Bayer MaterialScience LLC. The information in this MSDS relates only

to the specific material designated herein. Bayer MaterialScience LLC assumes no legal responsibility for use of or reliance upon the information in this MSDS.

MATERIAL SAFETY DATA SHEET

Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
100 Bayer Road
Pittsburgh, PA 15205-9741
USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC:	(800) 424-9300
INTERNATIONAL:	(703) 527-3887

NON-TRANSPORTATION

Emergency Phone:	Call Chemtrec
Information Phone:	(800) 662-2927

1. Product and Company Identification

Product Name:	PMB BLUESHIELD 0309
Material Number:	6688462
Chemical Family:	Aromatic Isocyanate
Chemical Name:	Diphenylmethane Diisocyanate (MDI)

2. Hazards Identification

Emergency Overview

Warning Color: Yellow **Form:** liquid viscous **Odor:** musty.
Toxic gases/fumes may be given off during burning or thermal decomposition. Closed container may forcibly rupture under extreme heat or when contents have been contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. Causes eye irritation. May cause lung damage.

Potential Health Effects

Primary Routes of Entry: Skin Contact, Inhalation, Eye Contact

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorders, Skin Allergies, Eczema

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation
Acute Inhalation
For Product: PMB BLUESHIELD 0309
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL

with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.

Chronic Inhalation
For Product: PMB BLUESHIELD 0309
As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent.

Skin
Acute Skin
For Product: PMB BLUESHIELD 0309
Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove. Contact with MDI can cause discoloration.

Chronic Skin
For Product: PMB BLUESHIELD 0309
Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction.

Eye
Acute Eye
For Product: PMB BLUESHIELD 0309
Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor or aerosol may cause irritation with symptoms of burning and tearing.

Chronic Eye
For Product: PMB BLUESHIELD 0309
Prolonged vapor contact may cause conjunctivitis.

Ingestion
Acute Ingestion
For Product: PMB BLUESHIELD 0309
May cause irritation; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

Carcinogenicity:
No Carcinogenic substances as defined by IARC, NTP and/or OSHA

3. Composition/Information on Ingredients

Hazardous components

Weight percent	Components	CAS-No.
60 - 100%	Polyurethane Prepolymer	39420-98-9

10 - 20%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
7 - 13%	Diphenylmethane Diisocyanate (MDI) Mixed Isomers	26447-40-5

4. First aid measures

Eye contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Get medical attention.

Skin contact
Immediately remove contaminated clothing and shoes. Wash off with soap and water. Use lukewarm water if possible. Wash contaminated clothing before reuse. For severe exposures, immediately get under safety shower and begin rinsing. Get medical attention if irritation develops.

Inhalation
Move to an area free from further exposure. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

Ingestion
Do NOT induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

Notes to physician
Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound. Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

5. Fire-fighting measures

Suitable extinguishing media: Dry chemical, Carbon dioxide (CO2), Foam, water spray for large fires.

Special Fire Fighting Procedures
Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

Unusual Fire/Explosion Hazards
Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO2 formed). Use cold-water spray to cool fire-exposed containers to minimize the risk of rupture. Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between water and hot diisocyanate can be vigorous.

6. Accidental release measures

Spill and Leak Procedures
Evacuate non-emergency personnel. Isolate the area and prevent access. Remove ignition sources. Notify management. Put on protective equipment. Control source of the leak. Ventilate. Contain the spill to prevent spread into drains, sewers, water supplies, or soil. Call Bayer at 412-923-1800 for assistance and advice. Major Spill or Leak (Standing liquid): Released material may be pumped into closed, but not sealed, metal container for disposal. Process can generate heat. Minor Spill or Leak (Wet surface): Cover spill area with suitable absorbent material (Kitty Litter, Oil-Dri®, etc). Saturate absorbent material with neutralization solution and mix. Wait 15 minutes. Collect material in open-head metal containers. Repeat applications of decontamination solution, with scrubbing, followed by absorbent until the surface is decontaminated. Check for residual surface contamination. Swype® test kits have been used for this purpose. Apply lid loosely and allow containers to vent for 72 hours to let carbon dioxide (CO2) escape.

Additional Spill Procedures/Neutralization
Neutralization solutions:
(1) Colorimetric Laboratories Inc. (CLI) decontamination solution.
(2) A mixture of 75% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10) and 5% n-propanol.
(3) A mixture of 80% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10).
(4) A mixture of 90% water, 3-8% ammonium hydroxide or concentrated ammonia, and 2% liquid detergent.

Bayer requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading. Such notification must be immediate and made by the person having knowledge of the release.

7. Handling and storage

Storage temperature:

minimum:	15 °C (59 °F)
maximum:	35 °C (95 °F)

Storage period
6 Months @ 25 °C (77 °F)**:** after receipt of material by customer

Handling/Storage Precautions
Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.

Further Info on Storage Conditions
Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200.

8. Exposure controls/personal protection

4,4'-Diphenylmethane Diisocyanate (MDI) (101-68-8)

US. ACGIH Threshold Limit Values
Time Weighted Average (TWA): 0.005 ppm
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
Ceiling Limit Value: 0.02 ppm, 0.2 mg/m3

Industrial Hygiene/Ventilation Measures

Local exhaust should be used to maintain levels below the TLV whenever MDI is heated, sprayed, or aerosolized. Standard reference sources regarding industrial ventilation (e.g., ACGIH Industrial Ventilation Manual) should be consulted for guidance about adequate ventilation. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA, Bayer, and others have developed sampling and analytical methods. Bayer methods can be made available, upon request.

Respiratory protection

Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or(b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).

Hand protection

Gloves should be worn., Nitrile rubber showed excellent resistance., Butyl rubber, neoprene and PVC are also effective.

Eye protection

When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of splash.

Skin and body protection

Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact., Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction., This data reinforces the need to prevent direct skin contact with isocyanates.

Medical Surveillance

All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted. Refer to the Bayer pamphlet (Medical Surveillance Program for Isocyanate Workers) for additional guidance.

Additional Protective Measures
Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions.

9. Physical and chemical properties

Form:	liquid
Appearance:	viscous
Color:	Yellow
Odor:	musty
Boiling point/boiling range:	ca. 208 °C (406.4 °F)
Flash point:	216 °C (420.8 °F) (ASTM D 93)
Vapour pressure:	< 0.0001 mmHg @ 25 °C (77 °F)
Density:	1.09 g/cm³ @ 25 °C (77 °F)
Specific Gravity:	1.09 @ 25 °C (77 °F)
Solubility in Water:	Insoluble - Reacts slowly with water to liberate CO2 gas
Viscosity, dynamic:	2,500 mPa.s @ 25 °C (77 °F)
Bulk density:	1,090 kg/m3 @ 25 °C (77 °F)

10. Stability and reactivity

Hazardous Reactions
Contact with moisture, other materials that react with isocyanates, or temperatures above 350 F (177 C), may cause polymerization

Materials to avoid
Water, Amines, Strong bases, Alcohols, Copper alloys

Hazardous decomposition products
By Fire and High Heat: Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke., Isocyanate, Isocyanic Acid, Other undetermined compounds

11. Toxicological information

Toxicity Data for PMB BLUESHIELD 0309
Toxicity Note
Toxicity data based on polymeric MDI.

Acute oral toxicity
LD50: > 2,000 mg/kg (rat, Male/Female)

Acute inhalation toxicity
LC50: 490 mg/m3, 4 h (rat)

Skin irritation
rabbit, Slightly irritating

Repeated dose toxicity
90 Days, inhalation: NOAEL: 1 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.
2 years, inhalation: NOAEL: 0.2, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.

Mutagenicity
Genetic Toxicity in Vitro:
Bacterial - gene mutation assay: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity
rat, Male/Female, inhalation, 2 Years, 6 hrs/day 5 days/week,

Exposure to a level of 6 mg/m3 polymeric MDI was related to the occurrence of lung tumors. This level is significantly over the TLV for MDI.

Developmental Toxicity/Teratogenicity
rat, female, inhalation, gestation days 6-15, 6 hrs/day, NOAEL (teratogenicity): 12 mg/m3, NOAEL (maternal): 4 mg/m3

No Teratogenic effects observed at doses tested., Fetotoxicity seen only with maternal toxicity.

Toxicity Data for Polyurethane Prepolymer
Toxicity Note
No data available for this component.

Toxicity Data for 4,4'-Diphenylmethane Diisocyanate (MDI)
Acute inhalation toxicity
LC50: 369 mg/m3, 4 h (rat, Male/Female)
LC50: > 2240 mg/m3, 1 h (rat) (OECD Test Guideline 403)

Acute dermal toxicity
LD50: > 10,000 mg/kg (rabbit)

Skin irritation
rabbit, Draize Test, Slightly irritating

Eye irritation
rabbit, Draize Test, Slightly irritating

Sensitisation
dermal: sensitizer (guinea pig, Maximization Test)
inhalation: sensitizer (Guinea pig)

Repeated dose toxicity
90 Days, inhalation: NOAEL: 0.3 mg/m3, (rat, Male/Female, 18 hrs/day, 5 days/week)
Irritation to lungs and nasal cavity.

Mutagenicity
Genetic Toxicity in Vitro:
Ames: (Salmonella typhimurium, Metabolic Activation: with/without)
Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing the positive mutagenicity results.
Genetic Toxicity in Vivo:
Micronucleus Assay: (mouse)
negative

Carcinogenicity
rat, Female, inhalation, 2 Years, 17 hrs/day, 5 days/week,
negative

12. Ecological information

Ecological Data for PMB BLUESHIELD 0309
Biodegradation
0 %, Exposure time: 28 d, i.e. not degradable

Bioaccumulation
Oncorhynchus mykiss (rainbow trout), Exposure time: 112 d, < 1 BCF
Does not bioaccumulate.

Acute and Prolonged Toxicity to Fish
LC0: > 1,000 mg/l (Danio rerio (zebra fish), 96 h)
LC0: > 3,000 mg/l (Oryzias latipes (Orange-red killifish), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: > 1,000 mg/l (Water flea (Daphnia magna), 24 h)

Toxicity to Aquatic Plants
NOEC: 1,640 mg/l, End Point: growth (Green algae (Scenedesmus subspicatus), 72 h)

Toxicity to Microorganisms
EC50: > 100 mg/l, (activated sludge, 3 h)

Additional Ecotoxicological Remarks
Ecotoxicity data based on polymeric MDI

Ecological Data for Polyurethane Prepolymer
Additional Ecotoxicological Remarks
No data available for this component.

Ecological Data for 4,4'-Diphenylmethane Diisocyanate (MDI)
Acute and Prolonged Toxicity to Fish
LC50: > 500 mg/l (Zebra fish (Brachydanio rerio), 24 h)

Acute Toxicity to Aquatic Invertebrates
EC50: > 500 mg/l (Water flea (Daphnia magna), 24 h)

13. Disposal considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method.

Empty Container Precautions
Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

14. Transport information

Land transport (DOT)

Proper shipping name: Other regulated substances, liquid, n.o.s. (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Hazard Class or Division: 9
UN/NA Number: NA3082
Packaging group: III
Hazard Label(s): Class 9

RSPA/DOT Regulated Components:
4,4'-Diphenylmethane Diisocyanate (MDI)

Reportable Quantity: 11,339 kg

Sea transport (IMDG)
Non-Regulated

Air transport (ICAO/IATA)
Non-Regulated

Additional Transportation Information
When in individual containers of less than the Product RQ, this material ships as non-regulated.

15. Regulatory information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):
Components

4,4'-Diphenylmethane Diisocyanate (MDI)	Reportable quantity: 5000 lbs

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):
Components
None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:
Components
4,4'-Diphenylmethane Diisocyanate (MDI)

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261)
Under RCRA, it is the responsibility of the person who generates a solid waste, as defined in 40 CFR 261.2, to determine if that waste is a hazardous waste.

State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

This product contains a trace (ppm) amount of phenyl isocyanate (CAS# 103-71-9) and monochlorobenzene (CAS# 108-90-7) as impurities.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight percent	Components	CAS-No.
60 - 100%	Polyurethane Prepolymer	39420-98-9
10 - 20%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
7 - 13%	Diphenylmethane Diisocyanate (MDI) Mixed Isomers	26447-40-5

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

Weight percent	Components	CAS-No.
5 - 15%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8

MA Right to Know Extraordinarily Hazardous Substance List:

Weight percent	Components	CAS-No.
1 - 5 ppm	Acetaldehyde	75-07-0
15 - 20 ppm	Furan	110-00-9
1 - 5 ppm	Propylene Oxide	75-56-9

California Prop. 65:

Warning! This product contains chemical(s) known to the State of California to be Carcinogenic.

Weight percent	Components	CAS-No.
1 - 5 ppm	Acetaldehyde	75-07-0
15 - 20 ppm	Furan	110-00-9
1 - 5 ppm	Cobalt and cobalt compounds	7440-48-4
1 - 5 ppm	Propylene Oxide	75-56-9

16. Other information

NFPA 704M Rating

Health	2
Flammability	1
Reactivity	1
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	2*
Flammability	1
Physical Hazard	1

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact person:	Product Safety Department
Telephone:	(412) 777-2835
MSDS Number:	112000022545
Version Date:	08/02/2011
Report version:	1.21

This information is furnished without warranty, express or implied. This information is believed to be accurate to the best knowledge of Bayer MaterialScience LLC. The information in this MSDS relates only to the specific material designated herein. Bayer MaterialScience LLC assumes no legal responsibility for use of or reliance upon the information in this MSDS.

Bayer MaterialScience

Product Information

BAYTEC Multi Purpose Primer

Moisture Cure Polyurethane Based Primer

Description

Baytec Multi Purpose Primer is a one component moisture cure primer used to increase the adhesion between Baytec SPR thick film coatings and a variety of substrates. The Baytec Multi Purpose Primer is based on a modified diphenylmethane diisocyanate (MDI) prepolymer and an organic solvent.

The Baytec Multi Purpose Primer is typically used for promoting adhesion to concrete, metal, and a variety of sheet goods such as EPDM, PVC, and granulated modified bitumen sheet. The product is unpigmented to avoid overlap or overspray lines on larger, multiday projects. As with any product, use of the Baytec Multi Purpose Primer in a given application must be tested (including field testing, etc.) in advance by the user to determine suitability.

Typical Properties*

Property	Value
Viscosity at 25°C, mPas	18
Specific Gravity at 25°C	0.94
Flash Point, PMCC, °C	40
Vapor Pressure	1mm at 22°C
VOC, % by volume	75.2
Appearance	dark amber clear liquid

Surface Preparation

Surface to be primed must be clean, dry, and structurally sound. All grease, oil, laitance, loose rust, and dust must be removed from the surface prior to applying the primer.

Substrate	Minimum	Recommended
Ferrous Steel or Aged Galvinized Steel	SSPC SP2	SSPC SP6 to 2 mil surface profile
Concrete – ICRI CSP 1-6	SSPC SP13	SSPC SP13, no loose aggregate or residual dust
PVC, EDM and granulated modified bitumen sheet goods	Powerwash minimum 3,500 psi.	Powerwash with detergent, minimum 3.500 psi., dust free when dry

Thinning

Baytec Multi Purpose Primer is a ready-to-use product and has been pre-diluted to the correct level. Do not thin further as optimal adhesion will be compromised.

Processing Conditions

Baytec Multi Purpose Primer can be applied using brush, roller, or one component spray equipment to dust-free, clean, and sound surfaces. It is essential to apply the material evenly and within the recommended coverage rates. Passes should be overlapped slightly to ensure total uniform coverage of the substrate. Once applied, the Baytec Multi Purpose Primer must be allowed to sufficiently moisture cure based on the cure and recoat guidelines outlined below:

Ambient Air Temperature:	45 – 120°F (7 –49°C)
Cure Time:	15 min. to 3 hours depending on ambient temperature and humidity
Typical Walk On Time:	Minimum 15 minutes
Typical Recoat	15 minutes to 4 hours depending on temperature and humidity

** These items are provided as general information only. They are approximate values and are not part of the product specifications.*

Spray equipment used for water based coatings or primers should be flushed with an organic solvent such as mineral spirits or acetone prior to use with the Baytec Multi Purpose Primer since residual water can react in the pumps and lines, potentially clogging the machinery.

Baytec Multi Purpose Primer catalyst can be used in very cold or dry environments. Please consult your Bayer MaterialScience technical representative for details.

Recommended Coverage Rates:	
Steel	500 -800 ft²/ gallon
Concrete	400 - 800 ft²/ gallon
PVC, EPDM, and granulated modified bitumen sheet goods	300 - 500 ft²/ gallon

Porous substrates may allow primer to soak in quickly. A second coat of primer can be applied over the first cured coat to further seal the surface and limit pinholes in the final top coating.

Adhesion Testing

Concrete – ICRI CSP 5 ASTM D412 >300 psi.

Storage and Handling

Baytec Multi Purpose Primer is sensitive to moisture. Original containers must be kept tightly closed to prevent contamination with moisture and foreign materials, which can adversely effect processing. A dessicant dryer cartridge is recommended when using product in drums. Recommended storage temperature is 50 – 86°F (10 – 30°C). Shelf life is 6 months when stored in closed, original containers at 77°F (25°C).

Health and Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling Baytec Multi Purpose Primer. Before working with this material, you must read and become familiar with the available information concerning the hazards, proper use and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets and product labels. Consult your Bayer MaterialScience representative or contact Bayer MaterialScience's Product Safety and Regulatory Affairs Department in Pittsburgh, PA

Note: The information contained in this bulletin is current as of August 2008. Please contact Bayer MaterialScience to determine whether this publication has been revised.

Bayer MaterialScience LLC

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20413 8/08

MATERIAL SAFETY DATA SHEET

Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
100 Bayer Road
Pittsburgh, PA 15205-9741
USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC:	(800) 424-9300
INTERNATIONAL:	(703) 527-3887

NON-TRANSPORTATION

Bayer Emergency Phone:	(412) 923-1800
Bayer Information Phone:	(800) 662-2927

1. Product and Company Identification

Product Name: BAYTEC MULTI-PURPOSE PRIMER
Material Number: 81042420

2. Hazards Identification

Emergency Overview

WARNING! Color: Opaque, Light brown **Form:** liquid **Odor:** mild, Fruity. Flammable. Toxic gases/fumes may be given off during burning or thermal decomposition. Closed container may forcibly rupture under extreme heat or when contents have been contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Vapors may travel to areas away from work site before igniting/flashing back to vapor source. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling solvents may be harmful or fatal. Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. Causes eye irritation. May cause lung damage. May affect nervous system. May cause liver damage. May cause kidney damage.

Potential Health Effects

Primary Routes of Entry: Skin Contact, Inhalation, Eye Contact

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorders, Skin Allergies, Eczema

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation
Acute Inhalation

For Product: BAYTEC MULTI-PURPOSE PRIMER
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible. Inhalation of the solvents may cause central nervous system depression with symptoms of nausea, lightheadedness, drowsiness, dizziness and loss of co-ordination.

For Component: t-Butyl Acetate
May be harmful by inhalation.

Chronic Inhalation
For Product: BAYTEC MULTI-PURPOSE PRIMER
As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling solvents may be harmful or fatal.

Skin
Acute Skin
For Product: BAYTEC MULTI-PURPOSE PRIMER
Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Contact with MDI can cause discoloration.

For Component: t-Butyl Acetate
Slightly toxic by skin absorption. Causes irritation with symptoms of reddening, itching, and swelling.

Chronic Skin
For Product: BAYTEC MULTI-PURPOSE PRIMER
Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests on MDI indicate skin contact alone may lead to an allergic respiratory reaction.

Eye
Acute Eye
For Product: BAYTEC MULTI-PURPOSE PRIMER
Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor may cause irritation with symptoms of burning and tearing.

For Component: t-Butyl Acetate
Causes irritation with symptoms of reddening, tearing, stinging, and swelling.

Chronic Eye
For Product: BAYTEC MULTI-PURPOSE PRIMER
Prolonged vapor contact may cause conjunctivitis.

Ingestion
Acute Ingestion
For Product: BAYTEC MULTI-PURPOSE PRIMER
May cause irritation; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

For Component: t-Butyl Acetate
Slightly toxic by ingestion.

Chronic Ingestion
For Product: BAYTEC MULTI-PURPOSE PRIMER
Chronic exposure to organic solvents has been associated with various neurotoxic effects including permanent brain and nervous system damage.

For Component: t-Butyl Acetate
May cause liver damage. May cause kidney damage.

Carcinogenicity:
No Carcinogenic substances as defined by IARC, NTP and/or OSHA

3. Composition/Information on Ingredients

Hazardous Components

Weight %	Components	CAS-No.
60 - 100%	t-Butyl Acetate	540-88-5
10 - 20%	Polyisocyanate Prepolymer based on MDI	CAS# is a trade secret
1 - 5%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
1 - 5%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9

4. First Aid Measures

Eye Contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Get medical attention if irritation develops.

Skin Contact
Immediately remove contaminated clothing and shoes. Wash off with soap and water. Use lukewarm water if possible. Wash contaminated clothing before reuse. For severe exposures, immediately get under safety shower and begin rinsing. Get medical attention if irritation develops and persists.

Inhalation
Move to an area free from further exposure. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

Ingestion
Do not induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

Notes to physician
Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound. Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

5. Fire-Fighting Measures

Suitable Extinguishing Media: dry chemical, carbon dioxide (CO2), foam, water spray for large fires.

Special Fire Fighting Procedures
Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.

Unusual Fire/Explosion Hazards
Flammable Liquid. Vapors may spread long distances and ignite. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO2 formed). Use cold-water spray to cool fire-exposed containers to minimize the risk of rupture. Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between water and hot diisocyanate can be vigorous. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flashback. Vapors or fumes may form explosive mixture with air.

6. Accidental release measures

Spill and Leak Procedures
Remove all sources of ignition, including flames, heat, and sparks. Use appropriate personal protective equipment during clean up. Dike or dam spilled material and control further spillage, if possible. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Ventilate area to remove vapors or dust. Do not allow spilled material or wash water to enter sewers, surface waters, or groundwater systems.

Additional Spill Procedures/Neutralization
Neutralization solutions:
(1) Colorimetric Laboratories Inc. (CLI) decontamination solution.
(2) A mixture of 75% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10) and 5% n-propanol.
(3) A mixture of 80% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10).
(4) A mixture of 90% water, 3-8% ammonium hydroxide or concentrated ammonia, and 2% liquid detergent.

Bayer requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading.

Such notification must be immediate and made by the person having knowledge of the release.

7. Handling and Storage

Storage Temperature:

minimum:	15 °C (59 °F)
maximum:	30 °C (86 °F)

Storage Period
12 Months

Handling/Storage Precautions
Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Keep away from heat, sparks and open flames. Ground and bond containers and equipment before transferring to avoid static sparks. Avoid contact with eyes. Use adequate ventilation and/or engineering controls in high temperature processing to prevent exposure to vapors. Wash thoroughly after handling. Keep container closed when not in use.

Further Info on Storage Conditions
Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200.

8. Exposure Controls / Personal Protection

t-Butyl Acetate (540-88-5)
US. ACGIH Threshold Limit Values
Time Weighted Average (TWA): 200 ppm
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
PEL: 200 ppm, 950 mg/m3

4,4'-Diphenylmethane Diisocyanate (MDI) (101-68-8)
US. ACGIH Threshold Limit Values
Time Weighted Average (TWA): 0.005 ppm
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
Ceiling Limit Value: 0.02 ppm, 0.2 mg/m3

Industrial Hygiene/Ventilation Measures
Local exhaust should be used to maintain levels below the TLV whenever MDI is heated, sprayed, or aerosolized. Standard reference sources regarding industrial ventilation (e.g., ACGIH Industrial Ventilation Manual) should be consulted for guidance about adequate ventilation. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA, Bayer, and others have developed sampling and analytical methods. Bayer methods can be made available, upon request.

Respiratory Protection
Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or(b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).

Hand Protection
Gloves should be worn., Butyl rubber gloves., Nitrile rubber gloves., Neoprene gloves

Eye Protection
When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of splash.

Skin and body protection
Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact., Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction., This data reinforces the need to prevent direct skin contact with isocyanates.

Medical Surveillance
All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted. Refer to the Bayer pamphlet (Medical Surveillance Program for Isocyanate Workers) for additional guidance.

Additional Protective Measures
Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions.

9. Physical and chemical properties

Form:	liquid
Color:	Opaque, Light brown
Odor:	mild, Fruity
pH:	Not Established
Freezing Point:	Not Established
Boiling Point/Range:	Not Established
Flash Point:	20 °C (68 °F)
Specific Gravity:	0.85
Viscosity, Dynamic:	160 cP
Bulk Density:	7.1 kg/m3

Molecular Weight: 142

10. Stability and Reactivity

Hazardous Reactions
Contact with moisture, other materials that react with isocyanates, or excessive temperatures may cause polymerization..

Materials to avoid
Water, Amines, Strong bases, Alcohols, copper alloys

Conditions to avoid
Avoid elevated temperatures to prevent unintentional unblocking. Heat, flames and sparks.

Hazardous decomposition products
By Fire and High Heat: Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke, Hydrogen cyanide, Isocyanate, Isocyanic Acid, Other undetermined compounds

11. Toxicological Information

Toxicity Data for BAYTEC MULTI-PURPOSE PRIMER
Toxicity Note
Toxicity data based on polymeric MDI.

Acute Oral Toxicity
LD50: > 2,000 mg/kg (rat, Male/Female)

Acute Inhalation Toxicity
LC50: 490 mg/m3, vapor, 4 h (rat)

Skin Irritation
rabbit, Slightly irritating

Repeated Dose Toxicity
90 Days, inhalation: NOAEL: 1 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.
2 years, inhalation: NOAEL: 0.2 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.

Mutagenicity
Genetic Toxicity in Vitro:
Bacterial - gene mutation assay: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity
rat, Male/Female, inhalation, 2 Years, 6 hrs/day 5 days/week
Exposure to a level of 6 mg/m3 polymeric MDI was related to the occurrence of lung tumors. This level is significantly over the TLV for MDI.

Developmental Toxicity/Teratogenicity
rat, female, inhalation, gestation days 6-15, 6 hrs/day, NOAEL (teratogenicity): 12 mg/m3, NOAEL (maternal): 4 mg/m3
No Teratogenic effects observed at doses tested. Fetotoxicity seen only with maternal toxicity.

Toxicity Data for t-Butyl Acetate

Acute Oral Toxicity
LD50: 4,500 mg/kg (Rat)

Acute Inhalation Toxicity
LC50: > 4000 ppm, (rat)

Acute dermal toxicity
LD50: > 2,000 mg/kg (rabbit)

Skin Irritation
Skin Irritation

Eye Irritation
Eye Irritation

Repeated Dose Toxicity
inhalation: NOAEL: Not Estalbished (<120 ppm), (rat,)

Toxicity Data for 4,4'-Diphenylmethane Diisocyanate (MDI)
Acute Inhalation Toxicity
LC50: 369 mg/m3, 4 hrs (rat, Male/Female)
LC50: > 2240 mg/m3, aerosol, 1 h (rat)

Acute dermal toxicity
LD50: > 10,000 mg/kg (rabbit)

Skin Irritation
rabbit, Draize Test, Slightly irritating

Eye Irritation
rabbit, Draize Test, Slightly irritating

Sensitization
dermal: sensitizer (guinea pig, Maximisation Test (GPMT))
inhalation: sensitizer (Guinea pig)

Repeated Dose Toxicity
90 Days, inhalation: NOAEL: 0.3 mg/m3, (rat, Male/Female, 18 hrs/day, 5 days/week)
Irritation to lungs and nasal cavity.

Mutagenicity
Genetic Toxicity in Vitro:
Ames: (Salmonella typhimurium, Metabolic Activation: with/without)
Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing the positive mutagenicity results.
Genetic Toxicity in Vivo:
Micronucleus Assay: negative (mouse)

Carcinogenicity
rat, Female, inhalation, 2 Years, 17 hrs/day, 5 days/week
negative

12. Ecological Information

Ecological Data for BAYTEC MULTI-PURPOSE PRIMER

Biodegradation
0 %, Exposure time: 28 Days

Bioaccumulation
Rainbow trout, Exposure time: 112 d, < 1 BCF
Does not bioaccumulate.

Acute and Prolonged Toxicity to Fish
LC0: > 1,000 mg/l (Zebra fish (Brachydanio rerio), 96 hrs)
LC0: > 3,000 mg/l (Killifish (Oryzias latipes), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: > 1,000 mg/l (Water flea (Daphnia magna), 24 hrs)

Toxicity to Aquatic Plants
NOEC: 1,640 mg/l, End Point: growth (Green algae (Scenedesmus subspicatus), 72 hrs)

Toxicity to Microorganisms
EC50: > 100 mg/l, (Activated sludge microorganisms, 3 hrs)

Additional Ecotoxicological Remarks
Ecotoxicity data based on polymeric MDI

Ecological Data for t-Butyl Acetate

Biodegradation
Readily biodegradable.

Bioaccumulation
approximately 10 BCF

Acute and Prolonged Toxicity to Fish
LC50: 327 mg/l (Fathead minnow (Pimephales promelas), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: 3,968 mg/l (Water flea (Daphnia magna))

Toxicity to Aquatic Plants
420 mg/l, EC5, (other: algae)

Ecological Data for 4,4'-Diphenylmethane Diisocyanate (MDI)

Acute and Prolonged Toxicity to Fish
LC50: > 500 mg/l (Zebra fish (Brachydanio rerio), 24 hrs)

Acute Toxicity to Aquatic Invertebrates
EC50: > 500 mg/l (Water flea (Daphnia magna), 24 hrs)

13. Disposal considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method.

Empty Container Precautions

Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

14. Transportation information

Land transport (DOT)

Proper Shipping Name: Butyl acetates solution (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Hazard Class or Division: 3
UN/NA Number: UN1123
Packaging Group: III
Hazard Label(s): Flammable Liquid

RSPA/DOT Regulated Components:
t-Butyl Acetate

Reportable Quantity: 5,000 lb

Sea transport (IMDG)

Proper Shipping Name: BUTYL ACETATES SOLUTION (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Hazard Class or Division: 3
UN-No: UN1123
Packaging Group: III
Hazard Label(s): Flammable liquids

Air transport (ICAO/IATA)

Proper Shipping Name: Butyl acetates solution (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Hazard Class or Division: 3
UN-No: UN1123
Packaging Group: III
Hazard Label(s): Flammable liquids

15. Regulatory Information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components	
t-Butyl Acetate	Reportable quantity: 5,000 lbs
4,4'-Diphenylmethane Diisocyanate (MDI)	Reportable quantity: 5,000 lbs

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard, Fire Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):
Components
None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:
Components
4,4'-Diphenylmethane Diisocyanate (MDI)
Polymeric Diphenylmethane Diisocyanate (pMDI)

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):
When discarded in its purchased form, this product meets the criteria of ignitability, and should be managed as a hazardous waste (EPA Hazardous Waste Number D001). (40 CFR 261.20-24)

State Right-To-Know Information
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight %	Components	CAS-No.
60 - 100%	t-Butyl Acetate	540-88-5
10 - 20%	Polyisocyanate Prepolymer based on MDI	CAS# is a trade secret
1 - 5%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
1 - 5%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

Weight %	Components	CAS-No.
60 - 100%	t-Butyl Acetate	540-88-5
1 - 5%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
1 - 5%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9
0.1 - 1%	tert-Butanol	75-65-0

California Prop. 65:
To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

16. Other Information

NFPA 704M Rating

Health	2
Flammability	3
Reactivity	1
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	2*
Flammability	3
Physical Hazard	1

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact Person:	Product Safety Department
Telephone:	(412) 777-2835
MSDS Number:	000000009012
Version Date:	03/26/2008
Report Version:	1.3

MATERIAL SAFETY DATA SHEET

Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
100 Bayer Road
Pittsburgh, PA 15205-9741
USA

TRANSPORTATION EMERGENCY

CALL CHEMTREC:	(800) 424-9300
INTERNATIONAL:	(703) 527-3887

NON-TRANSPORTATION

Bayer Emergency Phone:	(412) 923-1800
Bayer Information Phone:	(800) 662-2927

1. Product and Company Identification

Product Name: BAYTEC MULTI-PURPOSE PRIMER
Material Number: 81042420

2. Hazards Identification

Emergency Overview

WARNING! Color: Opaque, Light brown **Form:** liquid **Odor:** mild, Fruity. Flammable. Toxic gases/fumes may be given off during burning or thermal decomposition. Closed container may forcibly rupture under extreme heat or when contents have been contaminated with water. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Vapors may travel to areas away from work site before igniting/flashing back to vapor source. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling solvents may be harmful or fatal. Causes respiratory tract irritation. May cause allergic respiratory reaction. Harmful if inhaled. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. Causes skin irritation. May cause allergic skin reaction. Skin sensitizer. Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction. Causes eye irritation. May cause lung damage. May affect nervous system. May cause liver damage. May cause kidney damage.

Potential Health Effects

Primary Routes of Entry: Skin Contact, Inhalation, Eye Contact

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorders, Skin Allergies, Eczema

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Inhalation
Acute Inhalation

For Product: BAYTEC MULTI-PURPOSE PRIMER
Diisocyanate vapors or mist at concentrations above the TLV or PEL can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the TLV or PEL may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible. Inhalation of the solvents may cause central nervous system depression with symptoms of nausea, lightheadedness, drowsiness, dizziness and loss of co-ordination.

For Component: t-Butyl Acetate
May be harmful by inhalation.

Chronic Inhalation
For Product: BAYTEC MULTI-PURPOSE PRIMER
As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life threatening. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Sensitization can be permanent. Chronic overexposure to diisocyanates has also been reported to cause lung damage (including fibrosis, decrease in lung function) that may be permanent. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling solvents may be harmful or fatal.

Skin
Acute Skin
For Product: BAYTEC MULTI-PURPOSE PRIMER
Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Contact with MDI can cause discoloration.

For Component: t-Butyl Acetate
Slightly toxic by skin absorption. Causes irritation with symptoms of reddening, itching, and swelling.

Chronic Skin
For Product: BAYTEC MULTI-PURPOSE PRIMER
Prolonged contact can cause reddening, swelling, rash, and, in some cases, skin sensitization. Animal tests on MDI indicate skin contact alone may lead to an allergic respiratory reaction.

Eye
Acute Eye
For Product: BAYTEC MULTI-PURPOSE PRIMER
Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor may cause irritation with symptoms of burning and tearing.

For Component: t-Butyl Acetate
Causes irritation with symptoms of reddening, tearing, stinging, and swelling.

Chronic Eye
For Product: BAYTEC MULTI-PURPOSE PRIMER
Prolonged vapor contact may cause conjunctivitis.

Ingestion
Acute Ingestion
For Product: BAYTEC MULTI-PURPOSE PRIMER
May cause irritation; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

For Component: t-Butyl Acetate
Slightly toxic by ingestion.

Chronic Ingestion
For Product: BAYTEC MULTI-PURPOSE PRIMER
Chronic exposure to organic solvents has been associated with various neurotoxic effects including permanent brain and nervous system damage.

For Component: t-Butyl Acetate
May cause liver damage. May cause kidney damage.

Carcinogenicity:
No Carcinogenic substances as defined by IARC, NTP and/or OSHA

3. Composition/Information on Ingredients

Hazardous Components

Weight %	Components	CAS-No.
60 - 100%	t-Butyl Acetate	540-88-5
10 - 20%	Polyisocyanate Prepolymer based on MDI	CAS# is a trade secret
1 - 5%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
1 - 5%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9

4. First Aid Measures

Eye Contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Get medical attention if irritation develops.

Skin Contact
Immediately remove contaminated clothing and shoes. Wash off with soap and water. Use lukewarm water if possible. Wash contaminated clothing before reuse. For severe exposures, immediately get under safety shower and begin rinsing. Get medical attention if irritation develops and persists.

Inhalation
Move to an area free from further exposure. Get medical attention immediately. Administer oxygen or artificial respiration as needed. Asthmatic symptoms may develop and may be immediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

Ingestion
Do not induce vomiting. Wash mouth out with water. Do not give anything by mouth to an unconscious person. Get medical attention.

Notes to physician
Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound. Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

5. Fire-Fighting Measures

Suitable Extinguishing Media: dry chemical, carbon dioxide (CO2), foam, water spray for large fires.

Special Fire Fighting Procedures
Firefighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.

Unusual Fire/Explosion Hazards
Flammable Liquid. Vapors may spread long distances and ignite. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Closed container may forcibly rupture under extreme heat or when contents are contaminated with water (CO2 formed). Use cold-water spray to cool fire-exposed containers to minimize the risk of rupture. Large fires can be extinguished with large volumes of water applied from a safe distance, since reaction between water and hot diisocyanate can be vigorous. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flashback. Vapors or fumes may form explosive mixture with air.

6. Accidental release measures

Spill and Leak Procedures
Remove all sources of ignition, including flames, heat, and sparks. Use appropriate personal protective equipment during clean up. Dike or dam spilled material and control further spillage, if possible. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Ventilate area to remove vapors or dust. Do not allow spilled material or wash water to enter sewers, surface waters, or groundwater systems.

Additional Spill Procedures/Neutralization
Neutralization solutions:
(1) Colorimetric Laboratories Inc. (CLI) decontamination solution.
(2) A mixture of 75% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10) and 5% n-propanol.
(3) A mixture of 80% water, 20% non-ionic surfactant (e.g. Plurafac SL-62, Tergitol TMN-10).
(4) A mixture of 90% water, 3-8% ammonium hydroxide or concentrated ammonia, and 2% liquid detergent.

Bayer requires that CHEMTREC be immediately notified (800-424-9300) when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading.

Such notification must be immediate and made by the person having knowledge of the release.

7. Handling and Storage

Storage Temperature:

minimum:	15 °C (59 °F)
maximum:	30 °C (86 °F)

Storage Period
12 Months

Handling/Storage Precautions
Do not breathe vapors, mists, or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanates must not be exposed to vapor or spray mist. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Keep away from heat, sparks and open flames. Ground and bond containers and equipment before transferring to avoid static sparks. Avoid contact with eyes. Use adequate ventilation and/or engineering controls in high temperature processing to prevent exposure to vapors. Wash thoroughly after handling. Keep container closed when not in use.

Further Info on Storage Conditions
Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200.

8. Exposure Controls / Personal Protection

t-Butyl Acetate (540-88-5)
US. ACGIH Threshold Limit Values
Time Weighted Average (TWA): 200 ppm
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
PEL: 200 ppm, 950 mg/m3

4,4'-Diphenylmethane Diisocyanate (MDI) (101-68-8)
US. ACGIH Threshold Limit Values
Time Weighted Average (TWA): 0.005 ppm
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
Ceiling Limit Value: 0.02 ppm, 0.2 mg/m3

Industrial Hygiene/Ventilation Measures
Local exhaust should be used to maintain levels below the TLV whenever MDI is heated, sprayed, or aerosolized. Standard reference sources regarding industrial ventilation (e.g., ACGIH Industrial Ventilation Manual) should be consulted for guidance about adequate ventilation. To ensure that published exposure limits have not been exceeded, monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA, Bayer, and others have developed sampling and analytical methods. Bayer methods can be made available, upon request.

Respiratory Protection
Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C (PEL) can occur in inadequately ventilated environments when MDI is sprayed, aerosolized, or heated. In such cases, respiratory protection must be worn. The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or(b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL. The recommended APR cartridge is an organic vapor/particulate filter combination cartridge (OV/P100).

Hand Protection
Gloves should be worn., Butyl rubber gloves., Nitrile rubber gloves., Neoprene gloves

Eye Protection
When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of splash.

Skin and body protection
Avoid all skin contact. Depending on the conditions of use, cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact., Animal tests and other research indicate that skin contact with MDI can play a role in causing isocyanate sensitization and respiratory reaction., This data reinforces the need to prevent direct skin contact with isocyanates.

Medical Surveillance
All applicants who are assigned to an isocyanate work area should undergo a pre-placement medical evaluation. A history of eczema or respiratory allergies such as hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagnosed as sensitized to any isocyanate, no further exposure can be permitted. Refer to the Bayer pamphlet (Medical Surveillance Program for Isocyanate Workers) for additional guidance.

Additional Protective Measures
Emergency showers and eye wash stations should be available. Educate and train employees in the safe use and handling of this product. Follow all label instructions.

9. Physical and chemical properties

Form:	liquid
Color:	Opaque, Light brown
Odor:	mild, Fruity
pH:	Not Established
Freezing Point:	Not Established
Boiling Point/Range:	Not Established
Flash Point:	20 °C (68 °F)
Specific Gravity:	0.85
Viscosity, Dynamic:	160 cP
Bulk Density:	7.1 kg/m3

Molecular Weight: 142

10. Stability and Reactivity

Hazardous Reactions
Contact with moisture, other materials that react with isocyanates, or excessive temperatures may cause polymerization..

Materials to avoid
Water, Amines, Strong bases, Alcohols, copper alloys

Conditions to avoid
Avoid elevated temperatures to prevent unintentional unblocking. Heat, flames and sparks.

Hazardous decomposition products
By Fire and High Heat: Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), dense black smoke, Hydrogen cyanide, Isocyanate, Isocyanic Acid, Other undetermined compounds

11. Toxicological Information

Toxicity Data for BAYTEC MULTI-PURPOSE PRIMER
Toxicity Note
Toxicity data based on polymeric MDI.

Acute Oral Toxicity
LD50: > 2,000 mg/kg (rat, Male/Female)

Acute Inhalation Toxicity
LC50: 490 mg/m3, vapor, 4 h (rat)

Skin Irritation
rabbit, Slightly irritating

Repeated Dose Toxicity
90 Days, inhalation: NOAEL: 1 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.
2 years, inhalation: NOAEL: 0.2 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.

Mutagenicity
Genetic Toxicity in Vitro:
Bacterial - gene mutation assay: negative (Salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity
rat, Male/Female, inhalation, 2 Years, 6 hrs/day 5 days/week
Exposure to a level of 6 mg/m3 polymeric MDI was related to the occurrence of lung tumors. This level is significantly over the TLV for MDI.

Developmental Toxicity/Teratogenicity
rat, female, inhalation, gestation days 6-15, 6 hrs/day, NOAEL (teratogenicity): 12 mg/m3, NOAEL (maternal): 4 mg/m3
No Teratogenic effects observed at doses tested. Fetotoxicity seen only with maternal toxicity.

Toxicity Data for t-Butyl Acetate

Acute Oral Toxicity
LD50: 4,500 mg/kg (Rat)

Acute Inhalation Toxicity
LC50: > 4000 ppm, (rat)

Acute dermal toxicity
LD50: > 2,000 mg/kg (rabbit)

Skin Irritation
Skin Irritation

Eye Irritation
Eye Irritation

Repeated Dose Toxicity
inhalation: NOAEL: Not Estalbished (<120 ppm), (rat,)

Toxicity Data for 4,4'-Diphenylmethane Diisocyanate (MDI)
Acute Inhalation Toxicity
LC50: 369 mg/m3, 4 hrs (rat, Male/Female)
LC50: > 2240 mg/m3, aerosol, 1 h (rat)

Acute dermal toxicity
LD50: > 10,000 mg/kg (rabbit)

Skin Irritation
rabbit, Draize Test, Slightly irritating

Eye Irritation
rabbit, Draize Test, Slightly irritating

Sensitization
dermal: sensitizer (guinea pig, Maximisation Test (GPMT))
inhalation: sensitizer (Guinea pig)

Repeated Dose Toxicity
90 Days, inhalation: NOAEL: 0.3 mg/m3, (rat, Male/Female, 18 hrs/day, 5 days/week)
Irritation to lungs and nasal cavity.

Mutagenicity
Genetic Toxicity in Vitro:
Ames: (Salmonella typhimurium, Metabolic Activation: with/without)
Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing the positive mutagenicity results.
Genetic Toxicity in Vivo:
Micronucleus Assay: negative (mouse)

Carcinogenicity
rat, Female, inhalation, 2 Years, 17 hrs/day, 5 days/week
negative

12. Ecological Information

Ecological Data for BAYTEC MULTI-PURPOSE PRIMER

Biodegradation
0 %, Exposure time: 28 Days

Bioaccumulation
Rainbow trout, Exposure time: 112 d, < 1 BCF
Does not bioaccumulate.

Acute and Prolonged Toxicity to Fish
LC0: > 1,000 mg/l (Zebra fish (Brachydanio rerio), 96 hrs)
LC0: > 3,000 mg/l (Killifish (Oryzias latipes), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: > 1,000 mg/l (Water flea (Daphnia magna), 24 hrs)

Toxicity to Aquatic Plants
NOEC: 1,640 mg/l, End Point: growth (Green algae (Scenedesmus subspicatus), 72 hrs)

Toxicity to Microorganisms
EC50: > 100 mg/l, (Activated sludge microorganisms, 3 hrs)

Additional Ecotoxicological Remarks
Ecotoxicity data based on polymeric MDI

Ecological Data for t-Butyl Acetate

Biodegradation
Readily biodegradable.

Bioaccumulation
approximately 10 BCF

Acute and Prolonged Toxicity to Fish
LC50: 327 mg/l (Fathead minnow (Pimephales promelas), 96 h)

Acute Toxicity to Aquatic Invertebrates
EC50: 3,968 mg/l (Water flea (Daphnia magna))

Toxicity to Aquatic Plants
420 mg/l, EC5, (other: algae)

Ecological Data for 4,4'-Diphenylmethane Diisocyanate (MDI)

Acute and Prolonged Toxicity to Fish
LC50: > 500 mg/l (Zebra fish (Brachydanio rerio), 24 hrs)

Acute Toxicity to Aquatic Invertebrates
EC50: > 500 mg/l (Water flea (Daphnia magna), 24 hrs)

13. Disposal considerations

Waste Disposal Method
Waste disposal should be in accordance with existing federal, state and local environmental control laws. Incineration is the preferred method.

Empty Container Precautions

Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

14. Transportation information

Land transport (DOT)

Proper Shipping Name:	Butyl acetates solution (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Hazard Class or Division:	3
UN/NA Number:	UN1123
Packaging Group:	III
Hazard Label(s):	Flammable Liquid

RSPA/DOT Regulated Components:
t-Butyl Acetate

Reportable Quantity: 5,000 lb

Sea transport (IMDG)

Proper Shipping Name:	BUTYL ACETATES SOLUTION (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Hazard Class or Division:	3
UN-No:	UN1123
Packaging Group:	III
Hazard Label(s):	Flammable liquids

Air transport (ICAO/IATA)

Proper Shipping Name:	Butyl acetates solution (contains 4,4'-Diphenylmethane Diisocyanate (MDI))
Hazard Class or Division:	3
UN-No:	UN1123
Packaging Group:	III
Hazard Label(s):	Flammable liquids

15. Regulatory Information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components	
t-Butyl Acetate	Reportable quantity: 5,000 lbs
4,4'-Diphenylmethane Diisocyanate (MDI)	Reportable quantity: 5,000 lbs

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard, Fire Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):
Components
None

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:
Components
4,4'-Diphenylmethane Diisocyanate (MDI)
Polymeric Diphenylmethane Diisocyanate (pMDI)

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):
When discarded in its purchased form, this product meets the criteria of ignitability, and should be managed as a hazardous waste (EPA Hazardous Waste Number D001). (40 CFR 261.20-24)

State Right-To-Know Information
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Weight %	Components	CAS-No.
60 - 100%	t-Butyl Acetate	540-88-5
10 - 20%	Polyisocyanate Prepolymer based on MDI	CAS# is a trade secret
1 - 5%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
1 - 5%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

Weight %	Components	CAS-No.
60 - 100%	t-Butyl Acetate	540-88-5
1 - 5%	4,4'-Diphenylmethane Diisocyanate (MDI)	101-68-8
1 - 5%	Polymeric Diphenylmethane Diisocyanate (pMDI)	9016-87-9
0.1 - 1%	tert-Butanol	75-65-0

California Prop. 65:
To the best of our knowledge, this product does not contain any of the listed chemicals, which the state of California has found to cause cancer, birth defects or other reproductive harm.

16. Other Information

NFPA 704M Rating

Health	2
Flammability	3
Reactivity	1
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	2*
Flammability	3
Physical Hazard	1

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact Person:	Product Safety Department
Telephone:	(412) 777-2835
MSDS Number:	000000009012
Version Date:	03/26/2008
Report Version:	1.3