

Designer Molecules, Inc.

Material Safety Data Sheet

Product: BMI-5000
MSDS ID: R1171

Revised Date: 02/20/09
Replaces Date: 9/05/08

1. General Information

Trade Name: BMI-5000 (Polysset 5000 in Toluene)
Product Code: R1171
Product Type: Maleimide Terminated Polyimide Resin
Company: Designer Molecules, Inc.
10080 Willow Creek Rd.
San Diego, CA 92131
Telephone: 858-348-1122

Emergency phone number (spill, leak, fire, exposure or accident):
US Domestic 800-424-9300 (CHEMTREC)
International +1 703-527-3887

2. Composition Information

COMPONENT	CAS#	CONCENTRATION
Proprietary Bismaleimide Resin	921213-77-6	~ 50%
Toluene	108-88-2	~ 50%

3. Hazards Identification

EMERGENCY OVERVIEW:

WARNING
EYE IRRITANT
HARMFUL IF SWALLOWED
SKIN SENSITIZER
Amber Liquid Toluene Odor

HMIS ratings (scale 0 – 4)

Hazardous Materials
Identification System
Health (acute effects) = * 2
Flammability = 3
Physical = 1
Personal Protection = B

POTENTIAL HEALTH EFFECTS:

EFFECTS OF SINGLE ACUTE OVEREXPOSURE:

INHALATION: Vapors and/or aerosols that may be formed at elevated temperatures may be irritating to eyes and respiratory tract. Avoid breathing vapors or mists.
EYE CONTACT: May cause eye irritation. Contact with eyes causes redness and discomfort that is transient.
SKIN CONTACT: Brief contact may cause slight irritation with itching and local redness. Repeated and/or prolonged contact may cause skin sensitization.
SKIN ABSORPTION: May cause skin irritation.
SWALLOWING: Ingestion may cause abdominal discomfort, nausea, vomiting, and diarrhea.

SYMPTOMS OF EXPOSURE:

Signs and symptoms of exposure to this material (toluene) through breathing, swallowing, and/or passage of the material through the skin may include: metallic taste, stomach or intestinal upset, irritation (nose, throat, airways), central nervous system excitation (giddiness, light-headed feeling) followed by central nervous system depression (dizziness, drowsiness, fatigue, unconsciousness), temporary changes in mood or behavior, muscle weakness, loss of coordination, confusion, irregular heartbeat, coma and death.

TARGET ORGAN EFFECTS:

Prolonged intentional toluene abuse may lead to damage of many organ systems having effects on: central and peripheral nervous systems, vision, hearing, liver, kidneys, heart and blood.

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DEVELOPMENTAL INFORMATION:

Toluene may be harmful to the human fetus based on positive test results with laboratory animals. Case studies show that prolonged intentional abuse of toluene during pregnancy can cause birth defects.

CANCER INFORMATION:

No information.

4. First Aid Measures

SWALLOWING: Do not induce vomiting. Give person large amounts of water. Get immediate medical attention.

SKIN CONTACT: Wash area with soap and water. Remove contaminated clothing and shoes. Wash or clean before reuse.

INHALATION: Remove person to fresh air. If breathing has stopped, perform artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Flush with water for 15 minutes. Get immediate medical attention.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire and Explosion Hazard Data

FLASH POINT (method): 7°C (45°F), estimated

EXTINGUISHER METHOD: Water, CO₂, foam, dry chemical

SPECIAL FIRE-FIGHTING PROCEDURES:

Fire fighters should wear NIOSH/MSHA approved pressure demand self-contained breathing apparatus. Decontaminate or discard any clothing that may contain chemical residues.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Do not enter fire area without proper protection. See Section 10, Reactivity Data, for decomposition products possible. Fight fire from safe distance and protected location. Heat/impurities may increase temperature/build pressure/rupture closed containers, spreading fire, increasing risk of burns/injuries. Water may be ineffective in firefighting due to low solubility. Use water spray/fog for cooling. Pressure relief system may plug with solids, increasing risk of overpressure.

6. Accidental Release Measures

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Promptly absorb spill. Remove sources of ignition. Cover drains to prevent entry into waterways. Wear personal protective equipment (clothing and gloves) when handling spilled materials.

PERSONAL PRECAUTIONS:

Wear suitable protective equipment.

ENVIRONMENTAL PRECAUTIONS:

This product is essentially insoluble in water. This material is resistant to rapid biodegradation. May be toxic to aquatic life. Avoid runoff to waterways and sewers.

7. Handling and Storage

HANDLING: Avoid contact with eyes.
Keep container closed.

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Use with adequate ventilation.
Wash thoroughly after handling.

VENTILATION: General (mechanical) room ventilation is expected to be satisfactory for use at room temperature. Special, local ventilation is recommended at points where vapors generated at high temperatures may be vented to the workplace air.

STORAGE: Store at room temperature away from direct light and incompatible materials identified in the *Stability and Reactivity Section*.

8. Exposure Controls and Personal Protection Measures

COMPONENT	EXPOSURE LIMITS		
	<u>ACGIH</u>	<u>OSHA</u>	<u>MFG Working Standard</u>
Toluene	20 ppm TWA	300 ppm Ceiling 200 ppm TWA	

PERSONAL PROTECTION:

Respiratory: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use. If a respirator is used, a NIOSH/MSHA approved respirator with organic vapor/dust-mist fume filters represents the minimum level of respiratory protection.

Hands: Solvent impermeable gloves.

Eyes: Chemical safety goggles.

Skin: Chemical-resistant clothing.

OTHER PROTECTIVE EQUIPMENT:

Wear disposable protective clothing to facilitate recovery of any materials spilled.

ENGINEERING CONTROLS:

Ventilation:

Local Exhaust:

Fume hood at point of generation with sufficient exhaust to remove material from breathing zone.

EXPOSURE LIMITS:

None established by OSHA, ACGIH or UCC

9. Physical / Chemical Characteristics

APPEARANCE:

Physical State: Viscous Liquid
Color: Amber / Light brown
Odor: Toluene odor

OTHER PROPERTIES:

Boiling Point: 115° C (at std. temperature & pressure, unless noted below)
Melting Point: < 0° C (at std. temperature & pressure, unless noted below)
pH: Not applicable
Specific Gravity (H₂O=1): 0.9 @ 25° C
Vapor Pressure: 22 mmHg @ 20° C
Vapor Density (Air=1): Heavier than air.
Solubility in water: Insoluble
Evaporation rate (BuAc=1): 2 (solvent)
Avg. Molecular Weight: 5000 g/mol (neat oligomer)
Percent volatile (weight): 50%
Percent volatile (volume): 43%
Volatile organic content: 450 g/L

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10. Reactivity Hazard Data

STABILITY: Stable
CONDITIONS TO AVOID: Elevated temperatures in the presence of initiators
INCOMPATIBLE MATERIALS: Incompatible with strong oxidizing, strong reducers, free radical initiators, inert gases, oxygen scavengers.
HAZARDOUS DECOMPOSITION PRODUCTS: Acrid smoke-fumes/carbon monoxide/carbon dioxide and perhaps other toxic vapors may be released during a fire involving this product.
HAZARDOUS POLYMERIZATION: Will not occur during normal storage and handling.

11. Toxicological Information

ROUTE OF ENTRY: Inhalation; Ingestion; Eye Contact; Skin Contact
CARCINOGEN: There is no evidence that this product poses a carcinogenic risk under normal conditions of handling and use.

PRODUCT TOXICOLOGY

PRODUCT INFORMATION: Low acute toxicity under normal handling and use.

ACUTE EFFECTS OF EXPOSURE: May cause irritation to eyes and respiratory system. High exposure may cause anesthesia and irregular heartbeat due to the heart's increased sensitivity to adrenaline

CHRONIC EFFECTS OF EXPOSURE: The toxicological properties of this product have not been fully evaluated. Use of good industrial hygiene practices is required. Avoid direct contact with skin or eyes. Do not ingest or inhale.

TARGET ORGANS: Eyes, skin

POSSIBLE BIRTH DEFECT HAZARD: Yes

COMPONENT ORAL TOXICITY

Toluene Oral LD50: Rat 636 mg/kg

gastrointestinal tract. Aspiration of the product into the lungs following ingestion may cause pulmonary injury leading to pneumonitis. May cause nausea, vomiting and diarrhea.

NOTES ON ORAL TOXICITY

COMPONENT DERMAL TOXICITY

Toluene Dermal LD50: Rabbit 12124 mg/kg

skin. Repeated or prolonged contact may cause defatting of the skin resulting in dryness, cracking and dermatitis.

NOTES ON DERMAL TOXICITY

Mild irritant to skin. May be absorbed through

COMPONENT INHALATION TOXICITY

Toluene Inhalation LC50 (4hr.)
Rat 49 g/m³, Mouse 400 ppm

anesthetic properties when inhaled at concentrations above the occupational exposure limit, it may cause respiratory irritation, headache, fatigue, dizziness and incoordination. Avoid breathing vapor or mists.

NOTES ON INHALATION TOXICITY

May cause irregular heartbeat. The vapor has

12. Ecological Information

POTENTIAL EFFECT ON ENVIRONMENT: Do not allow to enter drains, sewers or watercourses.
MOBILITY: Insoluble
POTENTIAL TO BIOACCUMULATE: Unknown
AQUATIC TOXICITY: None established

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13. Disposal Considerations

WASTE DISPOSAL METHOD: Disposal should be in accordance with local, state or national legislation.

EMPTY CONTAINER WARNINGS: Empty containers may contain product residue, follow MSDS and label warnings even after they have been emptied.

14. Transport Information

US DOT CLASSIFICATION: UN1993 Flammable Liquid N.O.S. (Toluene), Class 3, Group II
CANADIAN TDG SURFACE: Class B Flammable liquid, div.2, (Toluene)
IMDG CLASSIFICATION: UN1993 Flammable Liquid N.O.S. (Toluene), Class 3, Group II
ICAO CLASSIFICATION: UN1993 Flammable Liquid N.O.S. (Toluene), Class 3, Group II
IATA CLASSIFICATION: UN1993 Flammable Liquid N.O.S. (Toluene), Class 3, Group II

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized safety officer. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

CALIFORNIA PROPOSITION 65: This product contains the following chemicals that are known to the State of California to cause cancer, birth defects or other reproductive harm.

Component	CAS Number
Toluene	108-88-3

TSCA INVENTORY STATUS: All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

SARA 313 TOXIC CHEMICALS:	Component	CAS Number
	Toluene	108-88-3

R Phrases: R 36, 38, 43
R 36/37/38 Irritating to eyes, respiratory system and skin

S Phrases: S 26, 28 (soap and water), 36

16. Other Information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgments of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user. While that data contained herein is factual, it should not be taken as warranty or representation for which the company assumes legal responsibility. It is offered solely for your consideration, investigation and verification. Any use of this data and information must be determined by the user to be in accordance with applicable federal, state and local laws and regulations.