

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

24-HOUR EMERGENCY PHONE NUMBER: 517-636-4400

Product: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN

Product Code: 49113

Effective Date: 03/26/99      Date Printed: 08/18/99      MSD: 005294

The Dow Chemical Company, Midland, MI 48674

Customer Information Center: 800-258-2436

2. COMPOSITION/INFORMATION ON INGREDIENTS

B-staged divinylsiloxane-bis-benzocyclobutene	CAS# 124221-30-3	38-50%
Mesitylene	CAS# 000108-67-8	40-61%
Polymerized 1,2-dihydro-2,2,4-trimethylquinoline	CAS# 026780-96-1	0.35-3.5%
2,6-bis{(4-azidophenyl)methylene}-4-ethylcyclohexanone	CAS# 114391-97-8	0.35-2.5%
1-1'-(1-methylethylidene) bis{4-(4-azidophenoxy)benzene}	CAS# 071550-57-7	0.35-4.0%

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

\*\*\*\*\*  
 \* Yellow amber liquid. Aromatic solvent odor. Combustible liquid \*  
 \* and vapor. Can cause allergic skin reaction. Causes eye irritation \*  
 \* Prolonged exposure may cause skin burns. \*  
 \* \*  
 \*\*\*\*\*

POTENTIAL HEALTH EFFECTS (See Section 11 for toxicological data.)

EYE: May cause moderate irritation with corneal injury.

SKIN: Prolonged or repeated exposure may cause skin burns. May cause more severe response if skin is abraded (scratched or cut). Contains a component which has caused allergic skin reactions in humans. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts.

INGESTION: Single dose oral toxicity is considered to be low. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; swallowing amounts larger than that may cause injury. If aspirated (liquid enters the lung), may cause lung damage or even death due to chemical pneumonia.

(Continued on Page 2)

\* or (R) Indicates a Trademark of The Dow Chemical Company

Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99

Date Printed: 08/18/99

MSD: 005294

-----  
3. HAZARDS IDENTIFICATION (CONTINUED)

INHALATION: Excessive vapor concentrations are attainable and could be hazardous on single exposure. Excessive exposure may cause irritation to upper respiratory tract and lungs. Signs and symptoms of excessive exposure may be anesthetic or narcotic effects.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Excessive exposure may cause irritation to upper respiratory tract and lungs. Repeated excessive exposures may cause central nervous system depression and blood effects. Signs and symptoms of excessive exposure may be anesthetic or narcotic effects. Contains component(s) which, in animals, have been shown to cause liver, lung and central nervous system effects.

CANCER INFORMATION: Available data are inadequate to evaluate carcinogenicity.

4. FIRST AID

EYE: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: Wash off in flowing water or shower.

INGESTION: Do not induce vomiting. Call a physician and/or transport to an emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

NOTE TO PHYSICIAN: If burn is present, treat as any thermal burn, after decontamination. The decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

(Continued on Page 3)

\* or (R) Indicates a Trademark of The Dow Chemical Company

Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99

Date Printed: 08/18/99

MSD: 005294

-----  
5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: 112F, 44C\*  
METHOD USED: SFCC  
AUTOIGNITION TEMPERATURE: 1022F

FLAMMABILITY LIMITS

LFL: 0.88% @ 100C\*  
UFL: 6.1% @ 100C\*  
\*Based on Mesitylene.

HAZARDOUS COMBUSTION PRODUCTS: Under fire conditions polymers decompose. The smoke may contain polymer fragments of varying compositions in addition to unidentified toxic and/or irritating compounds. Hazardous combustion products may include and are not limited to: carbon monoxide, carbon dioxide. Hazardous combustion products may include trace amounts of styrene.

OTHER FLAMMABILITY INFORMATION: Dense smoke is produced when product burns. Violent steam generation or eruption may occur upon application of direct water stream. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Contact with strong oxidizers may cause fire also.

EXTINGUISHING MEDIA: Water fog or fine spray, carbon dioxide, dry chemical, foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

MEDIA TO BE AVOIDED: Do not use direct water stream.

FIRE FIGHTING INSTRUCTIONS: Keep people away. Isolate fire area and deny unnecessary entry. Contain fire water run-off if possible. Fire water run-off, if not contained may cause environmental damage. Review the "Protect The Environment" section under "Accidental Release Measures" of this MSDS to determine if material should be allowed to burn out or be extinguished. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source. Do not use direct water stream. May spread fire. Eliminate ignition sources. Stay upwind. Keep out of low areas where

(Continued on Page 4)

\* or (R) Indicates a Trademark of The Dow Chemical Company

Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99      Date Printed: 08/18/99      MSD: 005294

-----

#### 5. FIRE FIGHTING MEASURES (CONTINUED)

gases (fumes) can accumulate.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

#### 6. ACCIDENTAL RELEASE MEASURES (See Section 15 for Regulatory Information)

PROTECT PEOPLE: Keep unnecessary people away; isolate hazard area and deny unnecessary entry.

PROTECT THE ENVIRONMENT: Vapor explosion hazard, keep out of sewers. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion.

CLEANUP: Use inert absorbent material such as sand or sawdust. Ventilate area and wash spill site after material pick up is complete.

#### 7. HANDLING AND STORAGE

HANDLING: Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. No smoking, open flames or sources of ignition in handling or storage area.

STORAGE: Use of non-sparking or explosion proof equipment may be necessary, depending upon the type of operation. Minimize sources of ignition, such as static buildup, heat, spark or flame.

#### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use only with adequate ventilation. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

##### PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: Use chemical goggles.

(Continued on Page 5)

\* or (R) Indicates a Trademark of The Dow Chemical Company

Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99

Date Printed: 08/18/99

MSD: 005294

-----  
8. EXPOSURE CONTROLS/PERSONAL PROTECTION (CONTINUED)

SKIN PROTECTION: When prolonged or frequently repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full-body suit will depend on operation. If hands are cut or scratched, use gloves impervious to this material even for brief exposures.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying or positive-pressure supplied-air respirator depending on the potential airborne concentration. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved positive-pressure supplied-air respirator.

EXPOSURE GUIDELINE(S): Trimethylbenzene (mesitylene): ACGIH TLV and OSHA PEL are 25 ppm. PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Yellow-amber liquid  
ODOR: Aromatic solvent odor  
VAPOR PRESSURE: 2.49 mm Hg @ 25C  
VAPOR DENSITY (Air=1): 4.1  
BOILING POINT: 324F 162C\*  
SOLUBILITY IN WATER: 0.1%  
SPECIFIC GRAVITY: 0.9521  
\*Based on Mesitylene.

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable at ambient temperatures.

CONDITIONS TO AVOID: The 2,6-Bis(4-azidophenyl)methylene)-4-ethylcyclohexanone component is sensitive to light and will start slowly decomposing when heating above 60 degrees C. See Hazardous Polymerization section. Avoid temperatures above 140C. Can react with itself at temperatures above 140C. Flammable vapors can be released at elevated temperatures.

(Continued on Page 6)

\* or (R) Indicates a Trademark of The Dow Chemical Company

Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99      Date Printed: 08/18/99      MSD: 005294

-----

10. STABILITY AND REACTIVITY (CONTINUED)

Product can oxidize at elevated temperatures.

INCOMPATIBILITY WITH OTHER MATERIALS: Strong oxidizing agent.

HAZARDOUS DECOMPOSITION PRODUCTS: Refer to Section 5 for Hazardous Combustion Products.

HAZARDOUS POLYMERIZATION: Can occur with heat.

11. TOXICOLOGICAL INFORMATION (See Section 3 for Potential Health Effects. For detailed toxicological data, write or call the address or non-emergency number shown in Section 1)

SKIN: The LD50 for skin absorption in female rabbits is >2000 mg/kg.

INGESTION: The oral LD50 for male rats is >2000 mg/kg.

MUTAGENICITY: In vitro mutagenicity studies were negative for component(s) tested.

12. ECOLOGICAL INFORMATION (For detailed Ecological data, write or call the address or non-emergency number shown in Section 1)

ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING: Based on information for mesitylene. Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

BIODEGRADATION & PERSISTENCE: Based on information for mesitylene. Biodegradation may occur slowly under aerobic conditions (in the presence of oxygen).

ECOTOXICOLOGY: Based on information for mesitylene. Material is slightly toxic to aquatic organisms on an acute basis (LC50 between 10 and 100 mg/L in most sensitive species).

13. DISPOSAL CONSIDERATIONS (See Section 15 for Regulatory Information)

DISPOSAL: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste character-

(Continued on Page 7)

\* or (R) Indicates a Trademark of The Dow Chemical Company

Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99                      Date Printed: 08/18/99                      MSD: 005294

-----  
13. DISPOSAL CONSIDERATIONS (See Section 15 for Regulatory Information)

izations and compliance with applicable laws are the responsibility solely of the waste generator. THE DOW CHEMICAL COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/Information On Ingredients).

FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customers Information Center at 800-258-2436 or 517-832-1556 for further details.

14. TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (D.O.T.):

For DOT regulatory information, if required, consult transportation regulations, product shipping papers or contact your Dow representative.

CANADIAN TDG INFORMATION:

For TDG regulatory information, if required, consult transportation regulations, product shipping papers, or your Dow representative.

15. REGULATORY INFORMATION (Not meant to be all-inclusive--selected regulations represented)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS

=====

(Continued on Page 8)

\* or (R) Indicates a Trademark of The Dow Chemical Company

Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99      Date Printed: 08/18/99      MSD: 005294

-----  
REGULATORY INFORMATION: (CONTINUED)

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard  
A delayed health hazard  
A fire hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

-----  
This product contains a chemical that requires TSCA export notification.

-----  
The chemical(s) is(are):

Mesitylene      CAS # 000108-67-8

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
MESITYLENE	000108-67-8	NJ3

NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).

(Continued on Page 9)

\* or (R) Indicates a Trademark of The Dow Chemical Company



Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99      Date Printed: 08/18/99      MSD: 005294

-----

REGULATORY INFORMATION: (CONTINUED)

OSHA HAZARD COMMUNICATION STANDARD:

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):

To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

CANADIAN REGULATIONS  
=====

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

- B3 - combustible liquid with a flash point between 37.8C and 93.3C
  - D2B - eye or skin irritant
  - D2B - skin sensitizer
- Refer elsewhere in the MSDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

CPR STATEMENT: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

HAZARDOUS PRODUCTS ACT INFORMATION: This product contains the following ingredients which are Controlled Products and/or on the Ingredient Disclosure List (Canadian HPA section 13 and 14):

COMPONENTS:	CAS #	AMOUNT(%w/w)
Mesitylene	000108-67-8	40-61%
2,6-bis {(4-azidophenyl) methylene}-4-ethylcyclohexanone	114391-97-8	0.35-2.5%

(Continued on Page10)

\* or (R) Indicates a Trademark of The Dow Chemical Company

Product Name: CYCLOTENE\* 4026-46 ADVANCED ELECTRONICS RESIN  
Product Code: 49113

Effective Date: 03/26/99

Date Printed: 08/18/99

MSD: 005294

-----  
16. OTHER INFORMATION

PMN: The EPA has identified potential concerns for PMN 95-421 ((2,6-bis{4-azidophenyl} methylene)-4-ethylcyclohexanone), a minor component in this formulation, regarding skin sensitization and eye irritation. EPA recommends that any workers who may be exposed to the substance during manufacturing, processing, and use wear a NIOSH-approved respirator, adequate protective clothing which covers exposed parts of the body, impervious gloves, and chemical safety goggles or equivalent eye protection.

PATENT INFORMATION: This material is covered by pending patent applications and by the following patents:

UNITED STATES:	CANADA:	JAPAN:	EUROPE:
4,540,763	1,242,833	1,556,670	0,191,858
4,642,329	1,260,481	1,565,110	0,372,000
4,661,193	1,264,896	1,664,540	
4,812,588	1,272,338	1,869,961	
5,185,391	1,324,386	1,903,238	
5,288,914			

MSDS STATUS: Revised Section 13, Disposal.

\* or (R) Indicates a Trademark of The Dow Chemical Company  
The Information Herein Is Given In Good Faith, But No Warranty,  
Express Or Implied, Is Made. Consult The Dow Chemical Company For  
Further Information.