Cymetech

SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY INFORMATION

Product Name	ULTRENE™ 99-6 DICYCLOPENTADIENE
Other Means of ID:	Product code: 99-6 DCPD
Recommended use:	Typically used as a base chemical or reactant to produce other products.
Restrictions:	Store at temperatures less than 140°F to reduce the risk of a heat-induced runaway reaction. Use caution while heating/melting with steam coils. The steam pressure must be safely regulated.

Company Identification	Cymetech Corporation 2468 Industrial Parkway Calvert City, KY 42029 United States of America
Telephone	(270) 395-3823
Chemtrec (24 Hour)	(800) 424-9300

SECTION 2: HAZARD IDENTIFICATION

Classification: Signal word – Danger

Oral: Acute toxicity, Category 4
Inhalation: Acute toxicity, Category 2
Skin corrosion/irritation: Category 2
Serious eye damage/irritation: Category 2
Flammable liquid: Category 3
Acute Aquatic Toxicity: Category 2
Chronic Aquatic Toxicity: Category 2

Hazard Statements:

H226	Flammable liquid and vapor
H302	Harmful if swallowed
H315	Causes skin irritation
H319	Causes serious eye irritation
H330	Fatal if inhaled
H411	Toxic to aquatic life with long lasting effects

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Precautionary Statements & Codes:

P210	Keep away from heat and open flames - no smoking
P233	Keep container tightly closed
P240	Ground/bond container and receiving equipment
P241	Use explosion proof electrical, ventilation and lighting
P242	Use only non-sparking tools
P243	Take precautionary measures against static discharge
P260	Do not breathe vapor
P264	Wash hands thoroughly after handling
P270	Do not eat, drink or smoke when using this product
P271	Use only outside in a well-ventilated area
P273	Avoid release to the environment
P280	Do not breathe vapors
P284	Wear respiratory protection
P310	Immediately call a poison control or physician
P320	Specific treatment is needed if contaminated
P321	Specific treatment needed, see first aid section
P330	Specific treatment urgent, see first aid section
P362	Take off contaminated clothing and wash before reuse
P391	Collect spillage. Hazardous to the aquatic environment
P405	Store locked up
P501	Dispose of contents in accordance with environmental requirements
P301 + P312	If swallowed, contact a medical professional
P302 + P352	If on skin, wash with plenty of water for at least 20 minutes
P303 + P361 + P353	If on skin, take off clothes and rinse immediately
P304 + P340	If inhaled, remove to fresh air and keep at rest and comfortable for breathing
P305 + P351 + P338	If in eyes, rinse cautiously with water for at least 20 minutes. Remove contact lenses, if present and easy to do so. Contact medical professional.
P337 + P313P	If eye irritation persists, get medical attention.
P332 + P313	If skin irritation persists, get medical attention.
P370 + P378	In case of fire, evacuate
P403 + P233	Store in well-ventilated place – Keep container tightly closed.
P403 + P235	Store in well-ventilated place – keep cool

Prevention: Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe vapors or spray. Use in a well-ventilated area. Ground container and receiving equipment; use explosion-proof electrical equipment; use only non-sparking tools; take precautionary measures against static discharge; use personal protective clothing as required. In case of inadequate ventilation, wear respiratory protection.

Response: If swallowed, immediately call a physician or medical assistance. If inhaled, remove person to fresh air and keep comfortable for breathing; immediately call for medical assistance. If in eyes or skin, rinse immediately contaminated clothing and skin with plenty of water and remove clothes. Remove contact lenses, if present and easily done, and continue rinsing. See Section 4 for more specific information. If on skin (or hair), remove all contaminated clothing; rinse skin with large amounts of water for at least 20 minutes. In case of fire: use ABC fire extinguisher. See Section 5 for more specific firefighting information.

Additional Specific Health Information:

Acute Health Effects
Inhalation can cause central nervous system effects, including death. Inhaling high vapor may cause nasal or respiratory tract irritation, dizziness, drowsiness, unconsciousness, headache or weakness. Causes skin irritation, eye and respiratory irritation.

Chronic Health Effects
Dicyclopentadiene may cause liver disorder (e.g., jaundice) and/or damage, kidney disorder (e.g., edema, proteinuria) and/or damage, and breathing disorders and/or lung damage.

Routes of Exposure/Entry
Eyes, skin contact, inhalation, ingestion.

Target Organs
Eyes, skin, respiratory tract, gastrointestinal tract, kidneys and liver.

Medical Conditions Aggravated by Exposure
Pre-existing skin problems may be aggravated by prolonged or repeated contact. In persons with impaired pulmonary function or obstructive airway diseases, inhalation may cause exacerbation of symptoms due to irritant properties.

SECTION 3: COMPOSITION, INFORMATION ON INGREDIENTS

--Ingredient--	--CAS Number--	--WT%--
Dicyclopentadiene	77-73-6	> 92
Cyclopentadiene Trimer	7158-25-0	5-7

Notes:
Amounts specified are typical and do not represent a specification. Butylated hydroxytoluene is added as an oxidation inhibitor.

SECTION 4: FIRST AID MEASURES

Acute Health Effects
Moderately toxic by ingestion. Aspiration into the lungs can cause severe pulmonary injury. Inhaling high vapor/aerosol concentrations can cause nasal and respiratory tract irritation, dizziness, drowsiness, unconsciousness, headache, weakness, and other central nervous system effects, including death.

Chronic Health Effects
Repeated or prolonged contact may cause irritation and dermatitis. Dicyclopentadiene may cause liver disorder (e.g., jaundice) and/or damage, kidney disorder (e.g., edema, proteinuria) and/or damage, and breathing disorders and/or lung damage.

Routes of Exposure/Entry
Eyes, skin contact, inhalation, ingestion.

Eye Contact
Immediately flush eyes with plenty of clean water for an extended time, not less than fifteen (15) minutes. Flush longer if there is any indication of residual chemical in the eye. Ensure adequate flushing of the eyes by separating the eyelids with fingers and roll eyes in a circular motion.

Skin Contact
Immediately remove contaminated clothing and shoes. Wash the affected area with plenty of soap and water until no evidence of the chemical remains (at least 20 minutes).

Inhalation
If affected, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion
Do not induce vomiting. Aspiration of material into the lungs due to vomiting can cause chemical pneumonitis which can be fatal. If irritation occurs or persists from any route of exposure, remove the affected individual from the area. Call a physician.

SECTION 5: FIRE FIGHTING MEASURES

Extinguishing Media
NFPA Class IC (Flammable liquid): Use ABC dry chemical, foam, CO_2, or water fog. Water may be ineffective due to the low flash point. Water spray (fog) can be used to absorb heat and to cool and protect surrounding exposed material.

Fire Fighting Instructions
Never direct a hose stream directly onto a burning flammable/combustible liquid. Solid or straight hose stream will cause fire to spread if directed onto a burning spill or into an open container of burning liquid. Wear self-contained breathing apparatus (SCBA) equipped with a full face-piece and operated in a pressure-demand mode (or other positive pressure mode) and approved protective clothing. Personnel without suitable respiratory protection must leave the area to prevent significant exposure to hazardous gases from combustion, burning or decomposition. In an enclosed or poorly ventilated area, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations.

Unusual Fire/Explosion Hazards
Vapors may form explosive mixtures in air under certain conditions. Gives off volatile vapors that are heavier than air and may travel along the ground or may be moved by ventilation and ignited by flame, sparks, heaters, or other ignition sources at distant locations (flashback potential). Hot vapor or mists may be susceptible to spontaneous combustion when mixed with air. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time and are influenced by pressure changes. Therefore, ignition may occur below published ignition temperatures. Use of this product in processes involving elevated-temperatures, vacuum if subject to sudden ingress of air, sudden escape of vapor or mist, etc., must be thoroughly evaluated to assure safe operation. Irritating or toxic substances will be emitted upon burning, combustion or decomposition. Do not flush spill to sewer. Runoff to sewer may cause a fire or explosion hazard.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate ignition sources. Ventilate area. If spill is large, isolate the hazard area. Limit access to the spill area to trained spill management/emergency personnel.

Containment Techniques
If a land spill: Contain by diking with sand, earth or other non-combustible material. Prevent flow into public sewer (explosion hazard), streams or other water systems. Blanket large spills with foam to minimize fire hazard and reduce vaporization. Remove as much as possible. Absorb remainder with an inert material.

If a water spill: Remove from surface by skimming using explosion proof pumps and equipment or by using suitable absorbents.

Clean-Up Techniques
Place waste into closed, labeled container and store in a safe location to await disposal. Transfer contaminated earth and/or diking/spill absorbent material to closed containers for recovery or disposal. Wash the spill area to remove final traces. Personal protective equipment and clothing must be utilized by persons performing this work.

During size-up, determine if fire-fighting guidelines or hazmat Level B protection is needed. See section 8 for additional guidance.

SECTION 7: HANDLING AND STORAGE

Safe Handling
Wash thoroughly after handling this product. Always wash up before eating, smoking, or using the facilities. Do not get in eyes, on skin or clothing. Avoid inhalation of aerosol, mist, spray, fume or vapor. Do not ingest, taste, or swallow. Wash contaminated clothing before reuse. Provide eyewash fountains and safety showers in the work area. Use under well-ventilated conditions. Eliminate ignition sources (e.g., sparks, static buildup, excessive heat, etc.). Pouring product from its container may cause an electrostatic buildup which may be discharged as a spark. A spark can be an ignition source for solvent vapor/air mixtures. Take precautions to prevent static discharge to prevent ignition of vapors. Do not cut, puncture, or weld on or near the container. Bond and ground all containers when transferring chemical. Use spark-proof tools and equipment. Emptied container may contain residual vapors or liquid which may ignite or explode. Do not reuse empty container without commercial cleaning or reconditioning.

Storage & Codes: P402, P403, P404, P410
Store in cool and dry, under well-ventilated conditions. Store in closed, labeled containers. Avoid storing containers in direct sunlight as vapors may accumulate in the head space creating pressure. Open containers carefully and slowly. Keep container closed when not in use. Store, transport, load, and unload at atmospheric pressure under inert atmosphere.

Conditions to Avoid
Lack or depletion of oxidation inhibitor. Do not expose to excessive heat or ignition sources. Overheating at temperatures over the flash point for a prolonged period of time may result in lowering of flash point

due to formation of monomeric cyclopentadiene species and possible polymerization (when heated at temperatures over 140°F).

Incompatibility with other materials
Avoid contact with strong oxidizing agents. Metal chloride salts or heat can catalyze polymerization.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

	ACGIH TWA	ACGIH STEL	OSHA TWA	OSHA STEL
Dicyclopentadiene	5 ppm	N/E	N/E	N/E
Cyclopentadiene trimer	N/E	N/E	N/E	N/E

N/E = not established

Engineering Controls
Always provide effective general and, when necessary, local exhaust ventilation to draw spray, aerosol, fume, mist and vapor away from workers to prevent routine inhalation. Ventilation systems must be designed in accordance with approved engineering standards using non-sparking, grounded ventilation system separate from other exhaust systems. Ventilation guidelines/techniques may be found in publications such as Industrial Ventilation: American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH, 45240-1634, USA.

Eye/Face Protection
Wear eye protection (chemical goggles or goggles and an 8-inch (minimum) full face shield where spilling or splashing may occur).

Skin Protection
Wear chemical resistant (impervious) gloves. Wear chemical resistant protective clothing.

Respiratory Protection
Wear a respirator approved by NIOSH/MSHA (e.g., an organic vapor respirator, a full face air purifying respirator for organic vapors, or a self-contained breathing apparatus) whenever exposure to aerosol, mist, spray, fume or vapor exceed the exposure limit(s) of any chemical substance listed in this SDS. Use respirator in accordance with manufacturer's use limitations and OSHA standard 1910.134 (29CFR).

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear liquid	**Upper / Lower flam limit**	LEL 1% and UEL 10.0%
Odor	Pungent	**Vapor pressure**	4 - 30 mm Hg @ 74°F
Odor threshold	Not determined	**Vapor density**	4.6 lb./ft.^{3} air = 1
pH	Not applicable	**Solubility**	Insoluble
Melting point	Not determined	**Partition coefficient**	Not available
Freezing point	Not applicable	**Auto ignition temperature**	Not available
Initial boiling point	284°F (140°C)	**Decomposition temperature**	Not applicable
Flash point	75°F (24°C)	**Viscosity**	Not applicable
Evaporation rate	Not available	**Specific gravity**	0.97 @ 60°F (16°C)

SECTION 10: STABILITY AND REACTIVITY

Stability
Hazardous polymerization will not occur if stored below 140°F (60°C). Normally stable under ambient conditions and if properly inhibited.

Hazardous Decomposition Products
Potential decomposition gases have not been fully determined but may include: Carbon monoxide, carbon dioxide, aliphatic and aromatic hydrocarbons. Distillation to dryness may produce peroxides. Peroxides may catalyze polymerization of DCPD at elevated temperatures.

Dicyclopentadiene will decompose to cyclopentadiene at > 280°F (> 138°C).

Conditions to Avoid
Lack or depletion of oxidation inhibitor. Do not expose to excessive heat or ignition sources. Overheating at temperatures over the flash point for a prolonged period of time may result in lowering of flash point due to formation of monomeric cyclopentadiene species and possible polymerization (when heated at temperatures over 140°F).

Incompatibility with other materials
Avoid contact with strong oxidizing agents. Metal chloride salts or heat can catalyze polymerization.

SECTION 11: TOXICOLOGICAL INFORMATION

Route	Species	Exposure
Dicyclopentadiene		
Inhalation	Mouse, male	LC50 143 PPM
Inhalation	Mouse, female	LC50 130 PPM
Inhalation	Rat, male	LC50 284 PPM
Inhalation	Rat, female	LC50 353 PPM
Oral	Mouse	LD50 190 mg/kg
Oral	Rat, adult	LD50 346-820 mg/kg
Skin	Rabbit, adult	LD50 5080 mg/kg

Dicyclopentadiene (DCPD): Inhalation studies indicate that male rats exposed 6 hours/day; 5 days/week for 13 weeks had evidence of functional and morphologic kidney changes at 1, 5.1, and 51 ppm. Female rats and mice of both sexes were unaffected. After a three-month recovery period, only the 51 ppm group showed some functional impairment although all animals retained some structural changes (most prevalent at the 51 ppm level). Since female rats and mice of both sexes were unaffected, effects of DCPD on the human kidney are unknown.

SECTION 12: ECOLOGICAL INFORMATION

Dicyclopentadiene – acute toxicity

96 Hour	LC50	Rainbow trout	22.86 - 42.3 mg/L

Bio concentration factor of 93.2 suggests that bio concentration in fish and aquatic organisms may occur. Volatilization of dicyclopentadiene to the atmosphere is expected to be a dominant fate process. The estimated half-life for a model river 1 m deep is 3 - 4 hours (1.2 SRC). A calculated soil absorption coefficient Koc value for dicyclopentadiene of 894 (2, SRC) suggests that sorption on sediment and suspended matter may be the important fate process (SRC). The estimated half-life for gas phase reaction of dicyclopentadiene with chemically produced hydroxyl radicals is 3.1 hour.

SECTION 13: DISPOSAL CONSIDERATIONS

HAZARDOUS WASTE: Dispose of waste (incinerate) in a RCRA permitted hazardous waste disposal facility. Flash point below 140°F (60°C) - EPA Hazardous Waste No.: D001. Federal Resource Conservation and Recovery Act (RCRA), 40CFR261.21.

CANADA: Dispose of waste in accordance with federal, provincial and local regulations. Product may be disposed of by incineration.

EPA CERCLA Reportable Quantity (RQ)

--Ingredient--

None listed

SECTION 14: TRANSPORTATION INFORMATION

UN Number	UN2048
Proper Shipping Name	Dicyclopentadiene
Hazard Class	3
UN Packing Group	III
Marine Pollutant	Yes
Note:	Marine Pollutant designation is applicable only if shipped over water.
Note:	Recommend shipping under nitrogen blanket.

U.S. DOT Reportable Quantity
--Ingredient--
None listed

SECTION 15: REGULATORY INFORMATION

SARA Title III Section 313
This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372:

Dicyclopentadiene (DCPD), CAS 77-73-6 (1% De-Minimis concentration)

To ensure complete compliance, check current EPA lists for determining reporting requirements.

U.S. (Federal) Regulations
TSCA: All components of this product are either listed on the U.S. Toxic Substances Control Act (TSCA) inventory of chemicals or are otherwise compliant with TSCA regulations.

California Proposition 65: This product does not contain any Proposition 65 chemicals.

International Regulations
Canadian DSL: All components in this product are on the Canadian Domestic Substances List (DSL) or are exempt from listing. The following components are on the Canadian Ingredient Disclosure List (WHMIS):

Dicyclopentadiene
1,3-Cyclopentadiene
Cyclopentadiene trimer

Canadian WHMIS: This product is controlled under the Canadian Hazardous Materials Information System (WHMIS) and is classified as:

B2
D1B

European Union EINECS: Compliant.

European Union REACH: Compliant, Reference number: 01-2119463601-44-0000.

SECTION 16: OTHER INFORMATION

HMIS Rating

HMIS Rating (H-F-R-PPI) 2-3-1-C

KEY: 0=Insignificant; 1=Slight; 2=Moderate; 3=High; 4=Extreme.
C = Safety glasses, gloves, synthetic apron

Hazardous Materials Identification System (HMIS). It was developed by the American Coatings Association as a compliance aid for the OSHA Hazard Communication Standard.

NFPA Rating

NFPA Rating (H-F-R) 2-3-1

National Fire Protection Association (NFPA) rating identifies the severity of hazards of material during a fire emergency (i.e., "on fire").

Cymetech

SAFETY DATA SHEET

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