

Material Safety Data Sheet

Material Name: **Dicyclopentadiene**

MSDS ID: NOVA-0006

Section 1 - Product and Company Identification

Synonyms: DCPD, cyclopentadiene dimer, bicyclopentadiene

Chemical Name: 4,7-Methano-1H-indene, 3a,4,7,7a-tetrahydro-

Chemical Family: Hydrocarbons

Material Use: Petrochemical feedstocks

Chemical Formula: C₁₀H₁₂

NOVA Chemicals

P.O. Box 2518, Station M

Calgary, Alberta, Canada T2P 5C6

EMERGENCY Telephone Numbers:

North America (Canada and US):

1-800-561-6682, 1-403-314-8767 (NOVA Chemicals) (24 hours)

1-800-424-9300 (CHEMTREC-USA) (24 hours)

1-613-996-6666 (Canutec-Canada) (24 hours)

Product Information: 1-412-490-4063

MSDS Information Email: msdsemail@novachem.com

General Comments

This product has been assigned a CAS # of 77-73-6.

Section 2 - Hazards Identification

HMIS Ratings: Health: 2 Fire: 3 Physical Hazard: 1 Personal Protection: chemical goggles, gloves, respirator, coveralls

*Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard*

NFPA Ratings: Health: 2 Fire: 3 Reactivity: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Emergency Overview

WARNING! FLAMMABLE. Product is a clear liquid with a pungent and penetrating odour. Vapour is heavier than air and may spread long distances. Distant ignition and flashback are possible. Flammable liquid and vapour can accumulate static charge. Liquid can float on water and may travel to distant locations and/or spread fire. This product is considered to be harmful by inhalation, skin contact and ingestion. This product is irritating to the eyes, nose and throat. Excessive inhalation of this material causes headache, dizziness, nausea and loss of coordination, and in extreme conditions coma and possibly death. Aspiration of liquid into lungs can cause severe injury. Ingestion may cause central nervous system effects and possible internal injury. Product may destabilize if subjected to extreme heat conditions.

Potential Health Effects: Eye

Contact with liquid and vapours from this product is irritating to the eyes.

Potential Health Effects: Skin

Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis. Material does not readily absorb through skin and is not reported to cause sensitization.

Potential Health Effects: Ingestion

This product is harmful if swallowed. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, nausea, loss of coordination, and in extreme conditions coma and possibly death. Small amounts of this product, if aspirated into the lungs, may cause severe pulmonary injury. Ingestion may cause kidney damage.

Potential Health Effects: Inhalation

This product may be harmful by inhalation. Excessive inhalation of this material causes headache, dizziness, nausea and loss of coordination, and in extreme conditions coma and possibly death. Repeated inhalation of this material may cause damage to kidney and possible blood disorders. Small amounts of this product, if aspirated into the lungs, may cause severe pulmonary injury.

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Section 3 - Composition/Information on Ingredients

CAS #	Component	Percent by Wt.
77-73-6	Dicyclopentadiene	84-87
Not Available	C9-C11 Codimers mixture	13-16
Not Available	Light hydrocarbons (below C8)	<0.1-0.15
98-29-3	4-tert-Butylcatechol (TBC) (added inhibitor)	<0.0105-0.0160

Additional Information

* 4-tert-Butylcatechol (TBC) is added (minimum 105 ppm) to stabilize product.

This product is hazardous under 29 CFR 1910.1200 (Hazard Communication).

This material is a controlled product under Canadian WHMIS regulations.

This product is regulated as a hazardous material / dangerous goods for transportation.

See Section 8 for applicable exposure limits. See Section 11 for applicable toxicity data.

Section 4 - First Aid Measures

First Aid: Eyes

Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention if symptoms develop or persist.

First Aid: Skin

Remove contaminated clothing and shoes. Wash immediately with soap and water. If odour persists, use of a mild detergent or oil-emulsifying soap or shampoo is recommended. Seek medical attention if extensive skin exposure has occurred and/or if irritation persists. Completely decontaminate clothing, shoes and other protective equipment before reuse or discard.

First Aid: Inhalation

Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband. Assist breathing if necessary. Seek immediate medical attention if the individual is not breathing, is unconscious or if any other symptoms persist. WARNING: Contact through mouth-to-mouth resuscitation may pose a secondary risk to the rescuer. Avoid mouth-to-mouth contact by using a mouth shield or guard to perform artificial respiration.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

First Aid: Notes to Physician

For more detailed medical emergency support information call 1-800-561-6682 or 1-403-314-8767 (NOVA Chemicals Emergency Response, 24 hours). Ensure thorough eye and skin decontamination. Treat unconsciousness, nausea, hypotension, seizures and cardiac arrhythmias in the conventional manner. Aspiration of this product during induced emesis can result in lung injury. If evacuation of stomach contents is considered necessary, use the method least likely to cause aspiration, such as gastric lavage after protecting the airway. Observe hospitalized patients for delayed chemical pneumonia, acute tubular necrosis, encephalopathy and dysrhythmias. Monitor for urinary phenol within 72 hours of acute exposure.

Section 5 - Fire Fighting Measures

See Section 9: Physical Properties for flammability limits, flash point and auto-ignition information.

General Fire Hazards

Fire and container explosion hazards are serious when this product is exposed to heat or flame. Vapours are heavier than air and may travel along the ground to some distant source of ignition and flash back. Material will float and can be reignited on surface of water. Consider need for immediate emergency isolation and evacuation for at least 300 metres (984 feet). If tank is involved in a fire, ISOLATE for 800 metres (1/2 mile) in all directions.

Explosion Hazards

Vapours may form explosive mixture with air. Keep containers away from source of heat or fire. Containers may explode when involved in a fire. Evacuate personnel to a distance of at least 0.8 to 1.6 kilometres (1/2 mile to 1 mile) if during a fire, or rail car, tank car, or major vessel rupture is possible. Product may destabilize if subjected to extreme heat conditions. Monitor heated vessels for pressure buildup.

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Hazardous Combustion Products

Under fire conditions, this product emits carbon monoxide, carbon dioxide, and/or low molecular weight hydrocarbons.

Extinguishing Media

Dry chemical, foam or carbon dioxide. Use water to cool fire-exposed containers and to protect personnel. Water spray may be an ineffective extinguishing medium. Monitor water run-off for flammability, and prevent from entering waterways, sewers, drains, ditches, underground or confined spaces and waterways.

Fire Fighting Equipment/Instructions

Reference 2008 Emergency Response Guidebook, Guide No. 130 for additional details and instructions. Position upwind. Keep unnecessary personnel away. Move containers from fire area if you can do so without risk. Fight fire from maximum distance or use unmanned holders or monitor nozzles. Immediately withdraw in case of fire and tank venting or heat discoloration of a tank. Fire fighters should wear full-face, self-contained breathing apparatus and impervious protective clothing. Avoid inhaling any smoke and combustion products. Remove and clean or destroy any contaminated clothing. Cool containers with flooding quantities of water until well after the fire is out. Control runoff waters to prevent entry into sewers, drains, ditches, underground or confined spaces and waterways.

Section 6 - Accidental Release Measures

Evacuation Procedures

Isolate area. Keep unnecessary personnel away. Alert stand-by emergency and fire fighting personnel. Monitor surrounding area for buildup of flammable concentrations in air.

Small Spills

Eliminate ignition sources. Spill or leak area should be isolated immediately for 25 to 50 metres (82 to 164 feet) in all directions. Keep upwind and out of low areas. Stop discharge if safe to do so. Contain discharge by booming on water or diking on ground. Spills on water will volatilize rapidly, making containment or recovery difficult. Remove liquid material with non-sparking approved pumps, skimmers or vacuum equipment. Absorb/adsorb residual materials and clean up with non-sparking tools. Prevent entry into sewers, drains, ditches, underground or confined spaces, water intakes and waterways. Shovel material with non-sparking tools into appropriate container for disposal.

Large Spills

The main issue with a DCPD spill is odour. Consider downwind evacuation for 300 metres (984 feet). Eliminate ignition sources. Keep upwind and out of low areas. Stop discharge if safe to do so. Contain liquids by booming on water or by diking on land to prevent entry into sewers, drains or waterways. Spills on water will volatilize rapidly, making containment or recovery difficult. Recover any pooled liquid material with approved, non-sparking pumps, skimmers or vacuum equipment. Use of vacuum trucks may cause strong odour problems downwind. An inert foam cover material may assist in short term vapour suppression. Absorb with DRY earth, sand or other non-combustible material and clean up with non-sparking tools. Prevent entry into sewers, drains, ditches, underground or confined spaces, water intakes and waterways. Soil remediation may be required.

Special Procedures

Contact local police/emergency services and appropriate emergency telephone numbers provided in Section 1. Ensure statutory and regulatory reporting requirements in the applicable jurisdiction are met. Wear appropriate protective equipment and clothing during cleanup. Individuals without appropriate protective equipment should be excluded from area of spill until cleanup has been completed.

See Section 8 for recommended Personal Protective Equipment and Section 13 for waste disposal considerations.

Section 7 - Handling and Storage

Handling Procedures

Keep locked up or secured. Handle in fully grounded, properly designed and approved equipment systems that are suitable for flammable liquids. Use with adequate ventilation. Do not ingest or inhale. Keep away from heat and ignition sources. No smoking or open flames permitted in storage, use or handling areas. Dissipate static electricity during transfer by grounding and bonding containers and equipment. Take special precautions when cold cutting or breaking into lines, or when cleaning and disposing of empty containers. Do not breathe gas,

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fumes, vapour or spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately. Avoid contact with skin and eyes. Keep away from incompatible materials such as oxidizing agents and acids. After handling, always wash hands thoroughly with soap and water.

Storage Procedures

Storage area should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Adequate security must be provided so that unauthorized personnel do not have access to product. Store in grounded, properly designed and approved vessels and away from incompatible materials. Store and use away from heat, sparks, open flame, or any other ignition source. Store according to applicable regulations for flammable materials for storage tanks, containers, piping, buildings, rooms, cabinets, allowable quantities and minimum storage distances. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Have appropriate extinguishing capability in storage area (e.g. portable fire extinguishers (dry chemical, foam or carbon dioxide)) and flammable gas detectors. Keep absorbents for leaks and spills readily available. Consider use of internal floating roof tanks or flame arrestors. Inspect vents during winter conditions for vapour ice buildup. Storage tanks should be above ground and diked to hold entire contents. Ensure product is stored and transported with the addition of a suitable inhibitor/stabilizer, such as tert-butyl catechol (TBC) or equivalent.

See Section 8: Exposure Controls/Personal Protection for appropriate Personal Protective Equipment. See Section 10 for information on Incompatibilities.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines

A: General Product Information

Refer to published exposure limits - use effective control measures and PPE to maintain worker exposure to concentrations that are below these limits. Ensure that eyewash stations and safety showers are in close proximity to work locations.

B: Component Exposure Limits

ACGIH, OSHA, NIOSH, EPA, Alberta, and Ontario exposure limit lists have been checked for major components listed with CAS registry numbers. Other exposure limits may apply, check with authorities.

*NOTE: The Vacated OSHA Permissible Exposure Limits (PELs) are those provided in the 1989 update to OSHA's Air Contaminants Standard 29 CFR 1910.1000. These limits were vacated by the U.S. Court of Appeals, Eleventh Circuit but may be enforceable in some states.

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ACGIH:	5 ppm TWA; 27 mg/m ³ TWA
OSHA (Vacated)*:	5 ppm TWA; 30 mg/m ³ TWA
NIOSH:	5 ppm TWA; 30 mg/m ³ TWA
Alberta:	5 ppm TWA; 27 mg/m ³ TWA
Ontario:	5 ppm TWA

ENGINEERING CONTROLS

Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems, and other process modifications. Ensure all exhaust ventilation systems are discharged to outdoors, away from air intakes. Supply sufficient replacement air to make up for air removed by exhaust systems. Administrative (procedure) controls and use of personal protective equipment may also be required.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses; chemical goggles are recommended if splashing is possible, or to prevent eye irritation from vapours.

Personal Protective Equipment: Skin/Hands/Feet

Use chemically resistant gloves when handling product. Wear chemical-resistant safety footwear with good traction to prevent slipping. Work clothing that sufficiently prevents skin contact should be worn, such as coveralls and/or long sleeves and pants. If splashing or contact with liquid material is possible, consider the need for an

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impervious overcoat. Fire resistant (i.e., Nomex) or natural fibre clothing (i.e., cotton or wool) is recommended. Synthetic clothing can generate static electricity and is not recommended where a flammable vapour release may occur. Static Dissipative (SD) rated footwear is recommended.

Personal Protective Equipment: Respiratory

If engineering controls and ventilation are not sufficient to prevent buildup of aerosols or vapours, appropriate NIOSH approved air-purifying respirators or self-contained breathing apparatus (SCBA) appropriate for exposure potential should be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air purifying respirators.

Personal Protective Equipment: General

Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain, and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

Section 9 - Physical & Chemical Properties

Physical State and Appearance:	Liquid	Colour:	Clear
Odour:	Pungent and penetrating	Odour Threshold:	Detectable at 0.011 ppm (dicyclopentadiene)
pH:	Not applicable	Vapour Pressure:	2 mm Hg at 20°C (68°F); 81 to 87 mm Hg at 37.7°C (99.9°F); 1.52 psi at 100°F (37.8°C)
Vapour Density @ 0°C (Air=1):	4.5	Boiling Point:	Range: 150°C to 190°C (302°F to 374°F)
Freezing Point:	-24°C (<-11°F)	Solubility (H2O):	Insoluble; reported 0.02% at 20°C (68°F)
Specific Gravity (Water=1):	Range: 0.97 to 0.98 at 20°C (68°F)	Evaporation Rate (n-Butyl Acetate=1):	Not available; estimate 100% volatile
Octanol/H2O Coeff.:	Range: log Pow = 2.78 to 2.89	Auto Ignition:	503°C (937.4°F)
Flash Point:	Range: 40°C to 50°C (104°F to 122°F)	Flash Point Method:	Open cup
Upper Flammable Limit (UFL):	6.3%	Lower Flammable Limit (LFL):	0.8%
Flammability Classification:	Flammable		

Section 10 - Stability & Reactivity Information

Chemical Stability

Stable when inhibited and stored under normal temperatures. Product may destabilize if subjected to extreme heat conditions. This product may form explosive peroxides; this product is listed in some references as shock sensitive.

Instability

DCPD will decompose to cyclopentadiene at temperatures >150°C (302°F). DCPD can partially polymerize at temperatures above 50°C (122°F). These polymer buildups may ignite in air and should be treated as pyrophoric material.

Chemical Stability: Conditions to Avoid

Keep away from heat, sparks, or open flame.

Incompatibility

Reactive with oxidizing agents, acids and halogens. May attack and degrade some types of plastics, rubbers and coatings. Vapours may form explosive mixture with air. Incompatible with strong acids, strong bases, metal salts and oxidizing materials like peroxides. Reactive with oxidizing agents. Vapours may form explosive mixture with air.

Possibility of Hazardous Reactions or Hazardous Polymerization

Can slowly polymerize under certain conditions.

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Corrosivity

Not corrosive to the common metals.

Hazardous Decomposition

Upon decomposition, this product emits cyclopentadiene, carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Special Remarks

Avoid exposure to sparks, flame, heat, and elevated temperatures. Rapid pressure increases may occur at greater than 150°C (302°F) during decomposition to cyclopentadiene.

Section 11 - Toxicological Information

A: Acute Toxicity - General Product Information

Material is irritating to the eyes, nose and throat. Testing indicates material is not a skin sensitizer. Main route of exposure is by inhalation with little absorption through the skin. Most people can smell DCPD when levels reach to 0.003 ppm. It is toxic to the central nervous system and may cause dizziness, headaches, loss of coordination and unconsciousness. Male rats exposed to high levels of DCPD by inhalation exhibited difficulty breathing, impaired gait, loss of coordination and convulsions. Female rats exhibited loss of coordination and slight tremors. Material is highly toxic through ingestion, with possible effects including kidney and lung damage. Aspiration into the lungs may cause chemical pneumonitis.

B: Acute Toxicity - LD50/LC50

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Inhalation LC50 Rat: 500 ppm/4H; Oral LD50 Rat: 346.5 mg/kg; Dermal LD50 Rat: >2000 mg/kg; Dermal LD50 Rabbit: 4380 mg/kg

C9-C11 Co-Dimers Mixture

Oral LD50 Rat: 346- 820 mg/kg; Inhalation LC50 Rat: Male - 284 ppm (1.52 g/m3), Female - 353 ppm (1.89 g/m3)

4-tert-Butylcatechol (added inhibitor) (98-29-3)

Oral LD50 Rat: 2820 mg/kg; Dermal LD50 Rabbit: 630 µL/kg

C: Chronic Toxicity - General Product Information

Prolonged and repeated exposure may damage the kidneys and affect the lungs. Signs of intoxication in animals include excessive salivation, anorexia, and loss of coordination. At higher doses, effects include convulsions, gastrointestinal disturbance, and haemorrhage of the lungs and intestines. Testing indicates that DCPD is not a skin sensitizer. No gene mutations or significant cytogenetic damage was observed in standard assay tests. Developmental toxicity range-finding studies were conducted by NTP in New Zealand white rabbits and Sprague-Dawley rats. Dicyclopentadiene caused maternal toxicity at doses of 200 mg/kg and greater; however did not cause any developmental effects in newborn animals.

D: Chronic Toxicity - Carcinogenic Effects

None of this product's components are listed by ACGIH, EPA, IARC, OSHA, or NTP.

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information

This product has the potential to produce a high to moderate level of toxicity in freshwater algae and a high to moderate level of acute toxicity in freshwater fish and invertebrates.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

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Test & Species	Results and Conditions
96 Hr LC50 <i>Lepomis macrochirus</i>	23 mg/L
96 Hr EC50 <i>Selenastrum capricornutum</i>	>100 mg/L
48 Hr EC50 <i>Daphnia magna</i>	11 mg/L

Environmental Fate/Mobility

Fugacity modeling demonstrated that members of this category partition primarily into the air (98%), soil (1%), water (less than 1%), and minimal partitioning into sediment. DCPD has high affinity for soil adsorption.

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Persistence/Degradability

The hydrocarbons that comprise this mixture have a very low potential to hydrolyze and do not photodegrade directly due to a minimal capacity to absorb appreciable light energy above 290 nm. However, atmospheric oxidation constitutes a significant route of degradation. Calculation of atmospheric half-lives of representative constituent chemicals identified a range of 0.7 to 53.0 hours as a result of indirect hydrolysis by hydroxyl radical attack.

Dicyclopentadiene (DCPD) will photo-degrade in air, with an estimated half-life of 1 to 3 hours. DCPD in surface waters will volatilize in 3 to 4 hours, with some possible adsorption into suspended matter or sediment. This will degrade depending on temperatures and water conditions in an estimated 80 days. DCPD biodegrades very slowly in ground waters or soils. Estimated half-life in soils is 4 to 7 years. Half-life for microbial decomposition in ground water under aerobic conditions is estimated at 1 to 2 years. Under aerobic conditions, material degrades into intermediates that are believed to be less odorous and less toxic than the original material.

Bioaccumulation/Accumulation

Dicyclopentadiene has a reported log Pow of 2.78 to 2.89. DCPD has been detected as a long-term soil contaminant from pesticide manufacturing and in water effluent discharges from some industrial complexes or incinerators. Low bioconcentration in fish and aquatic organisms may occur. No significant bioaccumulation has been found in fresh water birds, plants and exposed mammals.

Section 13 - Disposal Considerations

U.S./Canadian Waste Information

A: General Product Information

This product is known to be a hazardous waste according to US and Canadian regulations. The use, mixing or processing of this material may alter its properties or hazards. Contact federal, provincial/state and local authorities in order to generate or ship a waste material associated with this product to ensure materials are handled appropriately and meet all criteria for disposal of hazardous waste. **DO NOT ATTEMPT TO DISPOSE OF BY UNCONTROLLED IGNITION.** Since emptied containers retain product residue, follow safe handling/label warnings even after container is emptied.

See Section 7: Handling and Storage and Section 8: Exposure Controls/ Personal Protection for additional information that may be applicable for safe handling and the protection of employees.

Waste generator is advised to carefully consider hazardous properties and control measures needed for other materials that may be found in the waste.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Section 14 - Transportation Information

US DOT Information

Shipping Name: Dicyclopentadiene

UN/NA #: UN2048 **Hazard Class:** 3 **Packing Group:** III

Required Label(s): FLAMMABLE LIQUID

Additional Info.: 2008 Emergency Response Guidebook: Guide No. 130.

Canadian TDG Information

Shipping Name: DICYCLOPENTADIENE

UN #: UN2048 **Hazard Class:** 3 **Packing Group:** III

Required Label(s): FLAMMABLE LIQUID

Additional Info.: 2008 Emergency Response Guidebook: Guide No. 130.

International Air Transport Association (IATA) and International Civil Aviation Organization (ICAO) Information

Shipping Name: Dicyclopentadiene

UN #: UN2048 **Hazard Class:** 3 **Packing Group:** III

Required Label(s): FLAMMABLE LIQUID

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Material Name: **Dicyclopentadiene**

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International Maritime Dangerous Goods (IMDG) Code

Shipping Name: Dicyclopentadiene

UN #: UN2048 Hazard Class: 3 Packing Group: III

Required Label(s): FLAMMABLE LIQUID

Additional Info.: EmS No.: F-E, S-D

Marine Pollutant: No

Section 15 - Regulatory Information

A: International Regulations

Component Analysis - Inventory

Component	CAS #	US - TSCA	CANADA - DSL	EU - EINECS
Dicyclopentadiene	77-73-6	Yes	Yes	Yes
4-tert-Butylcatechol (TBC) (added inhibitor)	98-29-3	Yes	Yes	Yes

B: USA Federal & State Regulations

Ongoing occupational hygiene, medical surveillance programs, site emission or spill reporting may be required by Federal or State regulations. Check for applicable regulations.

USA OSHA Hazard Communication Class

This product is hazardous under 29 CFR 1910.1200 (Hazard communication). HCS Classes:

HCS CLASS: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).

HCS CLASS: Highly Toxic

HCS CLASS: Irritating substance.

HCS CLASS: Target organ effects.

USA Right-to-Know - Federal

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

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SARA 313: 1.0 % de minimis concentration

USA Right-to-Know - State

The following components appear on one or more of the following state hazardous substances lists. Some components (including those present only in trace quantities, and therefore not listed in this document) may be included on the Right-To-Know lists of other U.S. states. The reader is therefore cautioned to contact his or her NOVA Chemicals' representative or NOVA Chemicals' Product Integrity group for further U.S. State Right-To-Know information.

Component	CAS #	NJ	PA
Dicyclopentadiene	77-73-6	Yes	Yes
4-tert-Butylcatechol (TBC) (added inhibitor)	98-29-3	No	Yes

C: Canadian Regulations - Federal and Provincial

WHMIS Ingredient Disclosure List (IDL)

The following components are identified under the Canadian Hazardous Products Act - Ingredient Disclosure List (IDL):

Component	CAS #	Minimum Concentration
Dicyclopentadiene	77-73-6	1 %
4-tert-Butylcatechol (TBC) (added inhibitor)	98-29-3	1%

WHMIS Classification

Workplace Hazardous Materials Information System (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and the MSDS contains all of the information required by the CPR.

WHMIS CLASS B3: Combustible Liquid with a flashpoint between 37.8°C (100°F) and 93.3°C (200°F)

WHMIS CLASS D1A: Very Toxic

WHMIS CLASS D2B: Toxic (eye irritant)

Other Regulations

Ongoing occupational hygiene, medical surveillance programs, site emission or spill reporting may be required by Federal or Provincial regulations. Check for applicable regulations.

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Section 16 - Other Information

Label Information

WARNING! FLAMMABLE. Product is a clear liquid with a pungent and penetrating odour. Vapour is heavier than air and may spread long distances. Distant ignition and flashback are possible. Flammable liquid and vapour can accumulate static charge. Liquid can float on water and may travel to distant locations and/or spread fire. This product is considered to be harmful by inhalation, skin contact and if it is swallowed. This product is irritating to the eyes, nose and throat. Excessive inhalation of this material causes headache, dizziness, nausea and loss of coordination, and in extreme conditions coma and possibly death. Aspiration of liquid into lungs can cause severe injury. Ingestion may cause central nervous system effects and possible internal injury. Product may destabilize if subjected to extreme heat conditions.

FIRST AID:

SKIN: Remove contaminated clothing and shoes. Wash immediately with soap and water. If odour persists, use of a mild detergent or oil-emulsifying soap or shampoo is recommended. Seek medical attention if extensive skin exposure has occurred and/or if irritation persists. Completely decontaminate clothing, shoes and other protective equipment before reuse or discard.

EYES: Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention if symptoms develop or persist.

INHALATION: Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband. Assist breathing if necessary. Seek immediate medical attention if the individual is not breathing, is unconscious or if any other symptoms persist. **WARNING:** Contact through mouth-to-mouth resuscitation may pose a secondary risk to the rescuer. Avoid mouth-to-mouth contact by using a mouth shield or guard to perform artificial respiration.

INGESTION: DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

IN CASE OF A LARGE SPILL: The main issue with a DCPD spill is odour. Consider downwind evacuation for 300 metres (984 feet). Eliminate ignition sources. Keep upwind and out of low areas. Stop discharge if safe to do so. Contain liquids by booming on water or by diking on land to prevent entry into sewers, drains or waterways. Spills on water will volatilize rapidly, making containment or recovery difficult. Recover any pooled liquid material with approved, non-sparking pumps, skimmers or vacuum equipment. Use of vacuum trucks may cause strong odour problems downwind. An inert foam cover material may assist in short term vapour suppression. Absorb with DRY earth, sand or other non-combustible material and clean up with non-sparking tools. Prevent entry into sewers, drains, ditches, underground or confined spaces, water intakes and waterways. Soil remediation may be required.

References: Available on request.

Special Considerations

For additional information on equipment bonding and grounding, refer to the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity".

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Transport of Dangerous Goods by Road; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CEPA = Canadian Environmental Protection Act; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CPR = Controlled Products Regulations; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EC50 = Effective Concentration 50%; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EPA = Environmental Protection Agency; EU = European Union; FDA = Food and Drug Administration; GHS = Globally Harmonized System for the Classification and Labelling of Chemicals; HCS = Hazard Communication Standard; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; ICAO = International Civil Aviation Organization; IDL = Ingredient Disclosure List; IDLH = Immediately Dangerous to Life or Health; IMDG = International Maritime Dangerous Goods; IMO = International Maritime Organization; ISHL = Industrial Safety and Health Law; Kow = Octanol/water partition coefficient; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; LEL = Lower Explosive Limit; LFL = Lower Flammable Limit; LLV = Level Limit Ceiling Limit (Sweden dust); MAK = Maximum Concentration Value in the Workplace; MITI = Ministry of International Trade and Industry; MSDS = Material Safety Data Sheet; NAB = Threshold Values (Indonesia); NCEC = National Chemical Emergency Centre; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OEL = Occupational Exposure Limit; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; PNOC = Particulates Not Otherwise Classified; PPE = Personal Protective Equipment; PRTR = Designated Chemical Substance Law (Japan); PSD = Short Term Exposure Limit (Indonesia); RCRA = Resource Conservation and Recovery Act; REACH = Registration, Evaluation, Authorisation and Restriction of Chemical Substances; REL = Recommended Exposure Limit; RID = Transport of Dangerous Goods by Rail; SARA = Superfund Amendments and Reauthorization Act; SCBA = Self Contained Breathing

Material Safety Data Sheet

Material Name: **Dicyclopentadiene**

MSDS ID: NOVA-0006

Apparatus; SDS = Safety Data Sheet; SEPA = State Environmental Protection Administration; STEL = Short Term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UFL = Upper Flammable Limit; VLA-ED = Valor límite Ambiental de Exposición Diaria (Environmental Exposure Daily Limit Value); VME = valeur limite d'exposition (Occupational Exposure Limits); WHMIS = Workplace Hazardous Materials Information Systems

MSDS Prepared by: NOVA Chemicals

MSDS Information Phone Number: 1-412-490-4063

Other Information

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This is the end of MSDS # NOVA-0006.