Product Safety Assessment

*DOW™ Methyldicyclopentadiene*


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**Names**
- CAS No. 16327-42-7
- *DOW™* methyldicyclopentadiene
- Methyldicyclopentadiene
- 1-Methyldicyclopentadiene
- mDCPD
- 5-Methyltricyclo[5.2.1.0(2,6)]deca-3,8-diene
- 3a,4,7,7a-Tetrahydro-4,7-methano-1-methyl-1H-indene
- CPD-mCPD dimer

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**Product Overview**
- Methyldicyclopentadiene is a dark brown liquid with a fragrant odor. It is produced during the high-temperature cracking of petroleum fractions in the production of ethylene. *DOW™* methyldicyclopentadiene is a mixture of dicyclopentadiene, methyldicyclopentadiene, and other minor components.\(^1\) For further details, see **Product Description**.
- *DOW* methyldicyclopentadiene is a chemical intermediate that is often recycled into other compounds at the production site. It may also be used as a raw material in resin manufacturing or blended into gasoline. For further details, see **Product Uses**.
- Occupational exposure to methyldicyclopentadiene is possible during extraction, transfer, or use. In chemical manufacturing, this material is consumed in closed systems with engineering controls to prevent fugitive emissions. Because this material is an industrial chemical intermediate, consumer contact is not likely.\(^2\) For further details, see **Exposure Potential**.
- Based on health information for dicyclopentadiene, eye contact with methyldicyclopentadiene may cause slight, temporary irritation. Prolonged skin contact may cause skin burns, but is unlikely to result in absorption of harmful amounts. Prolonged, excessive inhalation may cause serious adverse effects, even death. This material is an aspiration hazard.\(^3\) For further details, see **Health Information**.
- Because methyldicyclopentadiene is produced in well-controlled closed systems, the potential for release to the environment is low. Based on information for dicyclopentadiene, methyldicyclopentadiene biodegrades slowly in the environment. Methyldicyclopentadiene has a low to moderate bioconcentration potential (tendency to accumulate in the food chain), and this material is toxic to fish and other aquatic organisms. For further details, see **Environmental Information**.

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Methyldicyclopentadiene liquid and vapors are combustible. The vapor may travel long distances and accumulate in low-lying areas. Ignition or flashback could occur. DOW™ methyldicyclopentadiene is stable under recommended storage conditions and use. Store away from heat or ignition sources. Exposure to temperatures above 150°C (302°F) could lead to hazardous polymerization, an uncontrolled chemical reaction resulting in the rapid build-up of heat and pressure. Avoid contact with acids and oxidizers. In case of spills, do not use clay-based absorbent materials or sawdust. For further details, see Physical Hazard Information.

Manufacture of Product

- Capacity – DOW™ methyldicyclopentadiene is produced in Terneuzen, The Netherlands, and Kallo, Belgium. Dow’s estimated dicyclopentadiene production capacity for 2009 was 3 kilotonnes (6 million pounds). Methyldicyclopentadiene production is included with dicyclopentadiene.
- Process – Methyldicyclopentadiene is produced during the steam cracking of naphtha and gas oil during ethylene production. It is recovered from the pyrolysis gasoline fraction along with dicyclopentadiene and several other cyclopentadiene dimers and trimers. At room temperature, cyclopentadiene “dimerizes” (reacts with a second cyclopentadiene molecule) to form the more stable dicyclopentadiene. Methyldicyclopentadiene is a dimer of cyclopentadiene and methylcyclopentadiene. The structurally similar compounds dicyclopentadiene and methyldicyclopentadiene are shown below.

Product Description

Methyldicyclopentadiene is a dark brown liquid with a fragrant odor. DOW™ methyldicyclopentadiene is a blend of dicyclopentadiene, methyldicyclopentadiene, and other cyclopentadiene dimers.

Product Uses

DOW™ methyldicyclopentadiene is a chemical intermediate that is most often reprocessed into other compounds at the production site. It may be used as feedstock in the manufacture of cycloaliphatic resins and C5/C9 aromatic hydrocarbon resins or used as a gasoline blending component.

Exposure Potential

DOW™ methyldicyclopentadiene is used in closed systems and is not used in consumer products. Based on the uses for methyldicyclopentadiene, the public could be exposed through:
- Workplace exposure – Exposure can occur in an ethylene production facility or in the various industrial or manufacturing facilities that use methyldicyclopentadiene for resin production.

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production or blending. It is produced, distributed, stored, and consumed in closed systems. Those working with this material in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Engineering controls, appropriate work processes, and personal protective equipment limit the potential for employee exposure. See Health Information.

- **Consumer exposure to products containing DOW™ methyldicyclopentadiene** – Dow does not sell this material for direct consumer use. When used in resin production, it is not present in the finished product. See Health Information.

- **Environmental releases** – Methyldicyclopentadiene released to air will degrade from exposure to sunlight (photodegradation). Due to its volatility and low water solubility, methyldicyclopentadiene released to water or soil would most likely evaporate to air, although a small portion of this material will tend to stay in water. This material is considered toxic to aquatic organisms on an acute basis. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Eliminate all sources of ignition immediately. For small spills, methyldicyclopentadiene should be absorbed with sand. Do not use absorbent materials such as clay, cellulose, or sawdust. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, evacuate the area. Only trained and properly protected personnel must be involved in clean-up operations. Contain the liquid to prevent contamination of soil, surface water, or ground water. Keep the material out of sewers. Methyldicyclopentadiene liquid and vapor are combustible. Apply vapor suppression foams until the spill can be cleaned up. Eliminate all sources of ignition immediately. Ventilate the area of the leak or spill. Use only explosion-proof equipment; ground and bond all containers and handling equipment. The material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Positive-pressure, self-contained breathing apparatus (SCBA) is recommended for emergency work. Warn the public of any downwind vapor explosion hazards. Use appropriate safety equipment, including appropriate skin protection. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Isolate the fire and deny unnecessary entry. Stay upwind of the fire. Keep out of low areas where vapors can accumulate. Consider the use of unmanned hose holders. Use water spray or fog, carbon-dioxide or dry-chemical extinguishers, or foam to fight the fire. A direct water stream may spread the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Fight the fire from a protected location or safe distance. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

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**Health Information**

The following health information is based on DOW™ dicyclopentadiene resin grade, a product that is chemically and structurally similar to methyldicyclopentadiene.

**Eye contact** – Eye contact may cause slight, temporary irritation.

**Skin contact** – Brief contact may cause moderate skin irritation with local redness. Prolonged skin contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage, along with drying and flaking of the skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts.

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**Inhalation** – Prolonged, excessive inhalation of this material may cause serious adverse effects, even death. Symptoms of excessive exposure may be anesthetic or narcotic effects or dizziness and drowsiness.

**Ingestion** – This material has moderate toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however swallowing larger amounts may cause serious injury, even death. Aspiration into the lungs may occur during ingestion or vomiting resulting in rapid absorption and injury to other body systems.

**Repeated exposure** – In animals, repeated excessive exposure to this material has been reported to affect the central nervous system, kidneys, and liver.

For more information, see the relevant [Safety Data Sheet](#).

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**Environmental Information**\(^{16,17}\)

The following environmental information is based on DOW™ dicyclopentadiene resin grade, a product that is chemically and structurally similar to methyldicyclopentadiene.

DOW methyldicyclopentadiene is volatile and poorly soluble in water. If released to water, it will have a tendency to evaporate, although a small portion of this material will tend to stay in water. Upon release to air, methyldicyclopentadiene will rapidly degrade from reaction with hydroxyl radicals.

Based on laboratory tests, methyldicyclopentadiene cannot be considered readily biodegradable. However, these results do not necessarily mean the material does not slowly biodegrade under environmental conditions.

Methyldicyclopentadiene shows low to moderate potential for bioconcentration (tendency to accumulate in the food chain), and it is toxic to aquatic organisms on an acute basis.

The [Organisation for Economic Co-operation and Development (OECD) SIDS Initial Assessment Profile for Dicyclopentadiene](http://www.inchem.org/documents/sids/sids/77736.pdf) concluded that, although this material has properties indicating a potential hazard to the environment, based on its use pattern this material is considered of low potential risk and low priority for further work. The report may be viewed at the link: [http://www.inchem.org/documents/sids/sids/77736.pdf](http://www.inchem.org/documents/sids/sids/77736.pdf).

For more information, see the relevant [Safety Data Sheet](#).

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**Physical Hazard Information**\(^{18,19}\)

Methyldicyclopentadiene liquid and vapor are combustible. The vapor may travel long distances and accumulate in low-lying areas, creating the potential for ignition or flashback. DOW™ methyldicyclopentadiene is stable under recommended storage conditions and use. Store this material away in an oxygen-free atmosphere away from heat or ignition sources. Exposure to temperatures above 150°C (302°F) could lead to hazardous polymerization, an uncontrolled chemical reaction resulting in the rapid build-up of heat and pressure. Avoid contact with acids and oxidizers. In case of spills, do not use clay-based absorbent materials or sawdust. Ground and bond all handling equipment before transferring or using this product.

For more information, see the relevant [Safety Data Sheet](#).
Regulatory Information
Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of DOW™ methyldicyclopentadiene. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet or Contact Us.

Additional Information
• Safety Data Sheet (http://www.dow.com/assistance/dowcig.htm)
• Contact Us (http://www.dow.com/aromatics/contact/index.htm)

For more business information about DOW™ methyldicyclopentadiene, visit the Dow Aromatics Co-products web site at http://www.dow.com/aromatics/.

References
1 Dicyclopentadiene Resin Grade Material Safety Data Sheet, The Dow Chemical Company, June 27, 2007, pages 1, 2, and 4–5.
7 Dicyclopentadiene Resin Grade Material Safety Data Sheet, The Dow Chemical Company, June 27, 2007, pages 1, 2, and 4–5.
9 Dow Aromatics Co-products – Dicyclopentadiene Resin Grade web page (http://www.dow.com/aromatics/prod/dcpd_resin.htm)


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