Product Safety Assessment

**DOW™ Resin Oil 80**

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Names
- CAS No. 68477-54-3
- High DCPD Resin Oil
- Resin Oil
- Petroleum distillate, steam cracked, C8–C12 fraction
- DOW™ Resin Oil 80

Product Overview
- DOW™ Resin Oil 80 is a clear to yellow liquid with a strong aromatic or camphor-like odor. It is a mixture of mainly unsaturated C9 to C12 components, rich in dicyclopentadiene. It originates from high-temperature cracking of petroleum fractions and is separated by distillation during the recovery of benzene from pyrolysis gasoline.¹ For further details, see Product Description.
- DOW Resin Oil 80 is intended to be used as an industrial chemical used in the production of hydrocarbon resins and as a feedstock for the recovery of dicyclopentadiene.² For further details, see Product Uses.
- Since DOW Resin Oil 80 is used in the production of hydrocarbon resins, the most likely route of exposure is contact with vapors in the workplace. General and/or local exhaust ventilation is required to ensure airborne concentrations are below exposure guidelines. Workers should wear safety glasses and gloves impervious to this material when prolonged or repeated contact could occur.³ For further details, see Exposure Potential.
- DOW Resin Oil 80 is harmful if swallowed, and if aspirated into the lungs, this material may cause lung damage or injury to other body systems; even death due to chemical pneumonia. Eye contact may cause pain and slight irritation, but corneal injury is unlikely. Prolonged or repeated skin contact may cause irritation. Repeated exposure may cause flaking or drying of the skin. A single prolonged skin contact is unlikely to result in absorption of harmful amounts. Excessive vapor concentrations are attainable and may cause irritation to the respiratory tract and central nervous system depression. Components in DOW Resin Oil 80 can cause cancer. Health hazards have been associated with some components of DOW Resin Oil 80, such as styrene, xylene, vinyl toluene, and naphthalene.¹ For further details, see Health Information.
- Groundwater contamination is possible in the event of accidental spills or leaks from production, transportation, or storage equipment.³ Based on information for the components of DOW Resin Oil 80, the bioconcentration potential is low to moderate and biodegradation...
would be expected to be low to moderate. DOW Resin Oil 80 is toxic to aquatic organisms with long lasting effects.\(^1\) For further details, see Environmental Information.

- DOW™ Resin Oil 80 is flammable. Its vapors may travel a long distance—ignition and/or flashback may occur. Avoid contact with oxidizing materials, acid catalysts, acids, and boron trifluoride. Hazardous polymerization can occur, especially at elevated temperatures or when catalyzed by aluminum chloride. Avoid temperatures above 140°C (284°F), which can accelerate decomposition. Decomposition can cause rapid pressure build-up in closed systems.\(^1\) For further details, see Physical Hazard Information.

### Manufacture of Product\(^2\)

- **Process** – DOW™ Resin Oil 80 originates from high-temperature cracking of petroleum fractions and is separated by distillation during the recovery of benzene from pyrolysis gasoline.
- **Production** – Dow produces this material in Plaquemine, Louisiana.

### Product Description

DOW™ Resin Oil 80 is a clear to yellow liquid with a strong aromatic or camphor-like odor.\(^3\) The major components of this complex mixture of hydrocarbons are dicyclopentadiene, vinyl toluenes, indene, α-methyl styrene, and styrene. It may also contain low amounts of naphthalene, xylene, and benzene.\(^2\) DOW Resin Oil 80 does not mix with water. The freezing point and boiling point vary with composition and are usually described by a range. DOW Resin Oil 80 is part of a category of materials described in the EPA High Production Volume (HPV) Program as the Resin Oil and Cyclodiene Dimer Concentrate Category.

For more detailed composition information, see the relevant Safety Data Sheet or Product Information Sheet.

### Product Uses\(^2,3,4\)

DOW™ Resin Oil 80 is primarily used to produce hydrocarbon-based resins such as C9 aromatic-based resins and as a feedstock in the production of dicyclopentadiene (DCPD). These resins typically are used in applications in which the color of the resin is not a determining factor, such as printing inks, road markings, paints, or (colored) adhesives.

### Exposure Potential\(^1,3\)

DOW™ Resin Oil 80 is used primarily in the production of industrial products. Based on this use, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a DOW Resin Oil 80 manufacturing facility or in the various industrial or manufacturing facilities that use it in production. Those working with DOW™ Resin Oil 80 in manufacturing operations could be exposed during

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**Use of Resin Oils and Cyclodiene Dimer Concentrate Streams (2001)\(^3\)**

- Hydrocarbon resins (DCPD containing) 32%
- Process recycle 7%
- Fuel blend stock 14%
- Hydrocarbon resins (low DCPD) 47%
maintenance, sampling, testing, or other procedures. Adequate ventilation should be used to maintain vapor levels below recommended guidelines. Workers should wear safety glasses and protective gloves and clothing to prevent exposure when prolonged or frequently repeated contact could occur. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. The American Conference of Governmental Industrial Hygienists (ACGIH) has established threshold limit values (TLV) and the U.S. Occupational Safety and Health Administration (OSHA) has established permissible exposure limits (PEL) for many of the components in DOW Resin Oil 80. These occupational exposure limits are used in the workplace to limit exposure to the components of this material.¹,³ See Health Information.

- **Consumer exposure** – Dow does not sell DOW Resin Oil 80 to consumers and it is produced, transported, and processed within industrial facilities where there is no expected consumer exposure. DOW Resin Oil 80 is used to produce certain commercial printing inks, paints, and adhesives. Follow product instructions to minimize the risk of exposure. See Health Information.

- **Environmental releases** – Environmental exposure to DOW Resin Oil 80 is limited since the material is produced, processed, and stored in industrial facilities in which the product is contained in closed systems, pipes, and storage vessels. Transport is by pipeline, barge, railroad tank car, or tank truck, so that the material is typically contained within the transport container except for accidental spills or leaks. When DOW Resin Oil 80 is used in its intended applications, it is reacted into a polymer or processed into another substance, so it is no longer present in the final product. DOW Resin Oil 80 is a flammable liquid. The major component of DOW Resin Oil 80 is DCPD, with a concentration of 40–55% by weight. Although emissions of DCPD from DOW Resin Oil 80 are only a portion of the total reported emissions of DCPD from all sources, reports to the U.S. EPA Toxics Release Inventory (TRI) indicate a 76% decrease in DCPD emissions from 1998 to 2002.⁵ In the event of a spill, appropriate actions should be taken to avoid fire, contamination of the environment, or exposure to the pure material. See Environmental, Health, and Physical Hazard Information, or the Safety Data Sheet.

- **Large release** – Industrial spills or releases are infrequent and generally contained. A large spill or release can be hazardous due to the physical properties, effects to the environment, or health hazards associated with this product or its components. If a large release occurs, contact local and/or state or provincial authorities. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

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**Health Information¹**

Brief eye contact with this product may cause pain or slight, temporary irritation. Corneal injury is unlikely.

Prolonged or repeated exposure may cause skin irritation. Repeated contact may cause drying or flaking of the skin. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts.

The single dose oral toxicity is moderate. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing amounts larger than that may cause injury. If aspirated into the lungs, material may cause lung damage (or even death) due to chemical pneumonia or may be rapidly absorbed through the lungs and result in injury to other body systems.

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Excessive vapor concentrations are attainable and excessive exposure may cause respiratory irritation and central nervous system depression. Symptoms of central nervous system depression (in order of increasing exposure) are headache, dizziness, drowsiness, and lack of coordination. In repeated excessive exposure studies with animals, effects have been reported on the central nervous and respiratory system, as well as the kidney, liver, and lungs.

**Health Considerations for Minor Components**
This product contains several minor components that have demonstrated toxic effects. Several of these minor components have caused cancer in laboratory animals: benzene, naphthalene, and styrene. Benzene is classified by IARC as Group 1: Carcinogenic to humans. Benzene is also classified as a known carcinogen by National Toxicology Program (NTP). Styrene and naphthalene are classified by IARC as Group 2B: Possibly carcinogenic to humans. For styrene, an increased incidence of lung tumors was observed in an inhalation study involving mice. However, data from other long-term animal studies and from studies of workers exposed to styrene do not conclude that styrene is carcinogenic. Although DOW™ Resin Oil 80 has not undergone chronic toxicity testing, cancer warnings are included in the Safety Data Sheet for this product based on the component information.

Some studies in humans report that repeated exposure to styrene may result in slight decreases in the ability to discriminate between colors. On exposure to high concentrations, styrene is also reported to have caused hearing loss in laboratory animals.

Vinyl toluene has been toxic to the fetus but did not cause birth defects in laboratory animal tests. Extreme doses of xylene given orally to pregnant mice resulted in an increase in cleft palate, a common abnormality in mice. Inhalation exposure of pregnant animals to xylene resulted in toxicity to the fetus but did not cause any birth defects.

For more information, see the relevant Safety Data Sheet.

**Environmental Information**
Based on information for the components of DOW™ Resin Oil 80, the bioconcentration potential is low to moderate. Likewise, based on information for the components, biodegradation would be expected to be low to moderate. DOW Resin Oil 80 is toxic to aquatic organisms with long lasting effects.

DOW Resin Oil 80 will not mix with water and will float on the surface. Prevent spills from entering soil, ditches, sewers, waterways, and/or groundwater.

For more information, see the relevant Safety Data Sheet.

**Physical Hazard Information**
DOW™ Resin Oil 80 is a flammable liquid. Containers, even those that have been emptied, can contain vapors.

DOW Resin Oil 80 is stable under recommended storage conditions. Avoid temperatures above 140°C (284°F), which can result in decomposition. Generation of gas during decomposition can cause rapid pressure build-up in closed systems. Hazardous decomposition products depend upon temperature, air supply, and the presence of other materials.
Avoid contact with oxidizing materials, acid catalysts, acids, and boron trifluoride. Hazardous polymerization can occur, especially at elevated temperatures. Polymerization can be catalyzed by aluminum chloride.

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™ Resin Oil 80. 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/hydrocarbons/aromatics/srh/safety.htm](http://www.dow.com/hydrocarbons/aromatics/srh/safety.htm))

For more information about DOW™ Resin Oil 80, see the Dow Aromatics Co-Products web site at [www.dow.com/hydrocarbons/aromatics/prod/](http://www.dow.com/hydrocarbons/aromatics/prod/).

**References**

1. *Resin Oil 80, Material Safety Data Sheet*, The Dow Chemical Company

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