Product Safety Assessment

**DOW™ Resin Feed Oils**

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**Names**

- CAS No. 68477-54-3
- Petroleum distillate, steam-cracked, C8–C12 fraction
- DOW resin feed oils
- DOW™ Resin Feed
- DOW Distilled Resin Oil
- DOW DRO

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**Product Overview**

- DOW™ resin feed oils are clear to yellow liquids with strong aromatic or camphor-like odors. They are mixtures of mainly aromatic C9 and C10 components, rich in indene and methylstyrenes, and do not mix with water. Two resin feed oils are produced and sold by Dow.¹² For further details, see Product Description.

- DOW resin feed oils are mainly used to produce hydrocarbon resins that can be used in applications such as printing inks, hot melt pressure sensitive adhesives, rubbers, paints, varnishes and road marking paints.³ For further details, see Product Uses.

- The most likely potential exposure route occurs in the workplace through inhalation of low-level concentrations in air of vapors that escape from the closed process. Because resin feed oils are used to make polymers and are consumed in the production process, consumer exposure to resin feed oils is unlikely. For further details, see Exposure Potential.

- Small amounts of DOW resin feed oils swallowed incidental to normal handling operations have low toxicity; however, swallowing larger amounts may cause injury. Aspiration into the lungs may occur during ingestion or vomiting and can cause lung damage or even death. Eye contact may cause moderate irritation and temporary corneal injury. Brief skin contact may cause severe irritation with pain and local redness. Repeated exposure may cause irritation, even a burn. Human case reports suggest naphthalene, a component of this product, may be absorbed through the skin in toxic amounts, especially in children. Excessive vapor concentrations are attainable and may cause irritation to the upper respiratory tract and central nervous system depression. Health hazards have been associated with some components of these DOW resin feed oils, such as styrene, ethylbenzene, and naphthalene.⁴⁵ For further details, see Health Information.

- Groundwater contamination is possible in the event of spills or leaks from production, transportation, or storage equipment.⁶ The bioconcentration potential for resin feed oils is low to moderate. Although the material is inherently biodegradable, biodegradation is slow. Resin
feed oils are toxic to aquatic organisms. For further details, see Environmental Information.

- DOW resin feed oils are flammable. They are stable under recommended storage conditions, but elevated temperatures or certain contaminants can cause decomposition or hazardous polymerization. For further details, see Physical Hazard Information.

## Manufacture of Product

- **Process** – DOW™ resin feed oils originate from high-temperature cracking of petroleum fractions and are separated by distillation during the recovery of benzene from pyrolysis gasoline. As a distillation “bottoms” product, they usually contain heavier components such as naphthalene. DOW Distilled Resin Oil has lower concentrations of naphthalene and other heavy components because it has been redistilled.

- **Production** – DOW resin feed oils are produced in Terneuzen and Rotterdam, The Netherlands.

## Product Description

DOW™ resin feed oils are clear to yellow liquids with a strong aromatic or camphor-like odor. The freezing point and boiling point vary with composition and are usually described by a range. Resin feed oils do not mix with water. Resin feed oils are available from Dow in two grades:

- **DOW Resin Feed** is a mixture of C9 compounds rich in indene and vinyltoluenes.
- **DOW Distilled Resin Oil (DRO)** is redistilled from the prime product to remove heavy components like naphthalene.

For more detailed composition information, refer to the relevant Safety Data Sheet or Product Data Sheet.

## Product Uses

DOW™ resin feed oils are used to produce hydrocarbon-based resins, such as C9 aromatic-based resins or C5/C9-based resins. These resins are typically used in applications in which the color of the resin is not very important, such as printing inks, road markings, or paints. They are also used for concrete-cure additives, floor tile, foundry-core binding, hot-melt pressure-sensitive adhesives, paper sizing, varnishes, rubbers, and sealing.

The applications for DOW DRO are similar. However, because of its low naphthalene and heavy components content, DOW DRO can also be used in applications where the lower naphthalene content of the resulting resin is an important factor.

## Exposure Potential

Based on the use of DOW™ resin feed oils, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a hydrocarbon processing facility or in the various industrial or manufacturing facilities that use resin oils in production. Those working with resin oils in manufacturing operations could be exposed during 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. There are established threshold limit values (TLV) and permissible exposure limits (PEL) for many of the components in these blends. These occupational exposure limits (OEL) are used in the workplace to limit exposure to the components of this material. See Health Information.

- **Consumer exposure to resin feed oils** – Consumer exposure to these materials is unlikely. DOW™ resin feed oils are produced, transported, and processed within industrial facilities where there are no expected consumer uses or exposure. DOW Resin feed oils are used to make polymers for various commercial paints, inks, varnishes, and other products that are rarely used by consumers. Following product instructions carefully minimizes the risk of exposure. These materials are consumed in the production process, leaving very little to none of the substance in the final product. See Health Information.

- **Environmental releases** – Environmental exposure to DOW resin feed oils is limited since the materials are produced, processed, and stored in industrial facilities in which the products are contained in closed systems, pipes, and storage vessels. Transport is by pipeline, barge, railroad tankcar, or tank truck so that the material is typically contained within the transport container except for accidental spills or leaks. In the event of a spill, appropriate actions should be taken to avoid fire, contamination of the environment, or exposure to resin feed oils. See Environmental, Health, and Physical Hazard Information.

- **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.

**Health Information**

Small amounts of DOW™ resins feed oils swallowed incidental to normal handling operations have low toxicity; however, swallowing larger amounts may cause injury. Aspiration into the lungs may occur during ingestion or vomiting and can cause lung damage or even death due to chemical pneumonia. Excessive exposure to components in DOW resin feed oils may cause hemolysis, impairing the blood’s ability to transport oxygen. In animals, effects have been reported on the central nervous system, kidney, liver, and spleen.

Eye contact with liquid or vapor resin feed oils may cause moderate irritation and slight temporary corneal injury.

Brief skin contact may cause severe irritation with pain and local redness. Repeated exposure may cause irritation, even a burn.

DOW Resin feed oils contain moderate amounts of naphthalene. Human case reports suggest that naphthalene may be absorbed through the skin in toxic amounts, especially in children.

Excessive vapor concentrations are attainable and excessive exposure may cause irritation to the upper respiratory tract (nose and throat) and central nervous system depression. Symptoms of excessive exposure may be anesthetic or narcotic effects, including dizziness or drowsiness.
Health Considerations for Components
DOW resin feed oils contain several components that have demonstrated toxic effects. Components that are present in this product have caused cancer in laboratory animals: naphthalene, benzene, ethylbenzene, and styrene. Benzene (<0.1%) is classified by International Agency for Research on Cancer (IARC) as Group 1: Carcinogenic to humans. Benzene is also classified as a known carcinogen by National Toxicology Program (NTP). In humans, there is limited evidence of cancer in workers involved in naphthalene production. Limited oral studies in rats were negative. An increased incidence of lung tumors was observed in mice from an inhalation study on styrene. The relevance of this finding to humans is uncertain since data from other long-term animal studies and from epidemiology studies of workers exposed to styrene do not provide a basis to conclude that styrene is carcinogenic.

For more information, see the relevant Safety Data Sheet.

Environmental Information
The bioconcentration potential for DOW™ resin feed oils is low to moderate. Although the materials are inherently biodegradable, biodegradation is slow. DOW resin feed oils are toxic to aquatic organisms.

DOW resin feed oils are immiscible in water and may float on the surface. Prevent any material from entering soil, ditches, sewers, waterways, and/or groundwater.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information
DOW™ resin feed oils are flammable liquids. Vapors are heavier than air and may travel a long distance and accumulate in low-lying areas. Ignition and/or flash back may occur. Store resin feed oils in steel containers, preferably outdoors, away from direct sunlight, above ground, and surrounded by dikes to contain spills or leaks. Containers, even those that have been emptied, can contain vapors.

DOW resin feed oils are stable under recommended storage conditions. Avoid elevated temperatures, which can result in decomposition. Generation of gas during decomposition can cause rapid pressure build-up in closed systems.

Avoid contact with oxidizing materials and clay-based absorbents and sawdust. Elevated temperatures can cause hazardous polymerization. Polymerization can be catalyzed by aluminum, aluminum chloride, and boron.

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 feed oils. 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.

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Additional Information

- Safety Data Sheets (http://www.dow.com/aromatics/srh/safety.htm)
- Aromatics website, The Dow Chemical Company (http://www.dow.com/aromatics/prod/)
- **DOW™ Resin Feed, Product Data Sheet**, The Dow Chemical Company, Form No. 778-00402, February 2008 (http://www.dow.com/aromatics/srh/safety.htm)
- European Chemical Substances Information System (http://ecb.jrc.it/esis/) - Search by CAS# 68477-54-3 to retrieve information.

For more information about DOW™ resin feed oils, see Dow’s aromatics web site at www.dowaromatics.com.

References

NOTICES:

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