
Product Safety Assessment

European Gasoline Blend Products

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Names

- DOWTM Blend TN100
- DOWTM Blend TN120
- DOWTM Blend TN160
- DOWTM Blend TN200
- DOWTM Gasoline Blend Products
- CAS No. 68476-55-1; CAS No. 68516-20-1
- CAS No. 68516-20-1
- CAS No. 68477-54-3
- Petroleum naphtha, steam-cracked, middle aromatic
- Petroleum distillates, steam-cracked, C8–12 fraction

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Product Overview

- Four gasoline blend products are manufactured and marketed in Europe by Dow Benelux BV, a foreign affiliate of The Dow Chemical Company: DOWTM Blend TN100, DOW Blend TN120, DOW Blend TN160, and DOW Blend TN200. These products are mixtures of mainly unsaturated C5 to C12 hydrocarbons that range from clear to yellow in color with a moderate to strong aromatic or camphor-like odor. They originate from high temperature cracking of petroleum fractions and are separated during the recovery of benzene from pyrolysis gasoline.¹ For further details, see [Product Description](#).
- The main application for these products is blending into gasoline sold as motor fuel. They can also be used as a source for recovering dicyclopentadiene, styrene, toluene, xylene, vinyl toluene, and indene.² For further details, see [Product Uses](#).
- The most likely exposure route for European gasoline blend products produced by Dow occurs in the workplace through inhalation of low-level concentrations of vapors that escape from the closed process. 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. Groundwater contamination is also possible in the event of spills or leaks from production, transportation, or storage equipment.³ As a general precaution, consumers should avoid inhalation of vapors when fueling vehicles since gasoline can contain benzene and other components. For further details, see [Exposure Potential](#).
- The single dose oral toxicity of these products is low. If aspirated into the lungs, they may cause injury. Hazards associated with eye contact vary from slight irritation and slight temporary corneal injury (DOW Blend TN120) to moderate irritation and corneal injury (DOW Blend TN160 and DOW Blend TN100) to moderate irritation and corneal injury being unlikely (DOW Blend TN200). For DOW Blend TN160 and DOW Blend TN100, prolonged skin exposure may cause irritation with local redness. For DOW Blend TN200, brief skin contact

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may cause severe irritation with pain and local redness. In all cases, prolonged skin contact is unlikely to result in absorption of harmful amounts. Excessive vapor concentrations are readily attainable and may cause irritation to the upper respiratory tract (nose and throat), lungs, and central nervous system. Serious health hazards have been reported for some of the components of these products.^{4,5,6} For further details, see [Health Information](#).

- DOW™ Blend TN160 and DOW Blend TN200 are not readily biodegradable. The biodegradation for DOW Blend TN120 has not been determined. These materials are toxic to aquatic organisms. For further details, see [Environmental Information](#).
- European gasoline blend products produced by Dow are extremely flammable. They are stable under normal storage and handling 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. Avoid contact with oxidizing compounds.^{7,8,9} For further details, see [Physical Hazard Information](#).

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Manufacture of Product¹⁰

- **Locations** – Dow Benelux BV, a foreign affiliate of The Dow Chemical Company, produces European gasoline blend products in Terneuzen, The Netherlands.
- **Process** – These products originate from high-temperature cracking of petroleum fractions and are separated by distillation during the recovery of [benzene](#) from pyrolysis gasoline.

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Product Description¹¹

European gasoline blend products produced by Dow Benelux BV are liquids that range from clear to yellow in color, with a moderate to strong aromatic or camphor-like odor. They do not mix with water. The products are low in sulfur, but the composition may vary depending on the cracker feedstock and conditions. The major components of European gasoline blend products are dicyclopentadiene (DCPD), ethylbenzene, styrene, toluene and xylene. These European gasoline blend products are available in four grades:

- DOW™ Blend TN100: a mixture of mainly toluene, xylenes and other aromatics
- DOW Blend TN120: a mixture of C5 and C9–C10 hydrocarbons
- DOW Blend TN160: a mixture of C8–C10 hydrocarbons
- DOW Blend TN200: a mixture of C8–C12 hydrocarbons

For more detailed composition information, see the relevant [Safety Data Sheet](#) or [Product Information Sheet](#).

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Product Uses^{12,13}

European gasoline blend products produced by Dow Benelux BV are used almost exclusively for blending into gasoline sold as motor fuel. DOW Blend TN160 and DOW Blend TN200 can also be used as a source for recovering [dicyclopentadiene](#), styrene, vinyl toluene, and indene.

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Exposure Potential^{14,15}

Based on the use of European gasoline blend products, the public could be exposed through:

- **Workplace exposure** – For industrial workers at hydrocarbon processing facilities, the most likely exposure route is inhalation of low-level concentrations in air of vapors that escape from the closed process, such as fugitive emissions from valve packings and pump seals. Other potentials for exposure may result during operations such as sampling, loading of bulk transportation vessels (tank cars, tanks trucks and barges), from emissions at floating-roof storage tanks or during infrequent equipment maintenance, and from emissions from control devices, such as flares. 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 gasoline blends. These occupational exposure limits (OEL) are used in the workplace to limit exposure to the components of this material.¹⁶ See [Health Information](#).
- **Consumer exposure to European gasoline blend products** – European gasoline blend products manufactured by Dow Benelux BV are not sold for use by consumers and they are produced, transported, and processed within industrial facilities in which there is no expected consumer exposure. European gasoline blend products are blended into gasoline, where they become one of many components in gasoline products. Consumers may come into contact with these materials when they fuel vehicles, since it may be a component of gasoline. As a general precaution, consumers should avoid inhalation of gasoline vapors to minimize the risk of exposure to benzene and other components that are likely components of gasoline. For exposure guidelines, see [Health Information](#).
- **Environmental releases** – Environmental exposure to European gasoline blend products is limited since the materials are 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. Once European gasoline blend products are blended into a gasoline product, releases into the environment are limited to accidental spills and leaks of the gasoline product. In its application as a component of fuels, European gasoline blend products are not intended to be released into the environment, but rather to be consumed / “burned” as a fuel. When used as a process intermediate, it is separated into components and is no longer present in its original form. European gasoline blend products and gasoline blended with these products are flammable liquids. In the event of a leak or spill, appropriate actions should be taken to avoid fire, contamination of the environment, or exposure to the pure material or gasoline blends. 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](#).

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Health Information^{17,18,19}

The single dose oral toxicity of European gasoline blend products is low. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing large amounts may cause injury. If aspirated into the lungs, these products may cause

lung damage due to chemical pneumonia or may be rapidly absorbed and result in injury to other body systems, even death.

Hazards associated with eye contact varies from slight irritation with very slight temporary corneal injury (DOW™ Blend TN120) to moderate irritation with corneal injury (DOW Blend TN160 and DOW Blend TN100) to moderate irritation with corneal injury unlikely (DOW Blend TN200).

For DOW Blend TN120, a short single exposure to skin may cause irritation. Repeated contact may cause drying or flaking of skin. For DOW Blend TN160 and DOW Blend TN100, prolonged skin exposure may cause irritation with local redness. Repeated exposure may cause skin burns. For DOW Blend TN200, brief skin contact may cause severe irritation with pain and local redness. Repeated exposures may cause irritation, even a burn. In all cases, prolonged skin contact is unlikely to result in absorption of harmful amounts.

Excessive vapor concentrations are readily attainable and may cause serious adverse effects, even death in some cases. Excessive exposure may cause irritation to the upper respiratory tract (nose and throat), lungs, and central nervous system, resulting in narcotic or anesthetic effects, including dizziness and drowsiness. For DOW™ Blend TN120, excessive exposure may also increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats).

Health Considerations for Minor Components

DOW European gasoline blend products contain several components that have demonstrated toxic effects. Several of these components have caused cancer in laboratory animals. Excessive exposure to some components may cause hemolysis, impairing the blood's ability to transport oxygen. Other health hazards associated with components of these products include:

- **Benzene:** In animal studies, has been shown to interfere with fertility in males. *In vitro* mutagenicity studies were positive. Animal mutagenicity studies were positive. This substance is classified as a category 1 carcinogen by the Commission of DOW European Communities (EC). Benzene is classified by the 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).
- **Ethylbenzene:** Has caused birth defects in laboratory animals. Has been shown to cause cancer in laboratory animals. It is listed as a Group 2B carcinogen by IARC.
- **1,3-Butadiene:** Has caused minor birth defects in laboratory animals, but only at doses toxic to the mother and were judged to be a consequence of maternal toxicity. Butadiene has been shown to cause injury to reproductive organs in mice after prolonged exposure, although effects on reproduction have not been observed. *In vitro* mutagenicity studies were positive. Animal mutagenicity studies were positive. This substance is classified as a category 1 carcinogen by the EC. Epidemiology studies have linked employment in two different chemical operations, each with a different type of cancer.
- **Toluene:** Has been toxic to the fetus in laboratory animals at doses toxic to the mother. It has caused birth defects in mice when administered orally, but not by inhalation. Toluene is classified as a reproductive toxicant (category 3) by the EC for effects upon fetal development.
- **Xylene:** Has caused toxicity to the fetus in animal inhalation studies, but did not cause birth defects. Xylene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations, but this has not been reported in humans. 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.
- **Styrene:** Was toxic to the fetus at concentrations having an adverse effect on the mother. Birth defects are unlikely. Life time inhalation exposure of mice to styrene produced an increased incidence of lung tumors in treated animals. Studies investigating the relevance of the mouse tumors for human health suggest this is a mouse-specific effect with little or no

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relevance for human health. Styrene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations. However, the relevance to humans is unknown. Some studies in humans report that repeated exposure to styrene may result in minor decreases in the ability to discriminate between colors.

- **Naphthalene:** Cataracts and other eye effects have been reported in humans repeatedly exposed to naphthalene vapor or dust. Human case reports suggest naphthalene may be absorbed through the skin in toxic amounts, especially in children.

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

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Environmental Information^{20,21,22}

DOW™ Blend TN160 and DOW Blend TN200 are not readily biodegradable. The biodegradation for DOW Blend TN120 has not been determined. These materials are toxic to aquatic organisms.

These European gasoline blend products do not mix with water and may float on the surface. Prevent spilled materials from entering soil, ditches, sewers, waterways, and/or groundwater.

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

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Physical Hazard Information^{23,24,25}

European gasoline blend products are extremely flammable. Minimize sources of ignition, such as static build-up, heat, spark, or flame. Store materials in steel containers, preferably located outdoors, away from direct sunlight, above ground, and surrounded by dikes to contain spills or leaks. Keep containers tightly closed in a cool, well-ventilated place. Hold bulk storage under nitrogen blanket. Damaged or punctured drums should be emptied and disposed of properly.

These products are stable under normal storage and handling conditions. Avoid temperatures above 140°C (284°F), which can result in hazardous decomposition. Generation of gas during decomposition can cause rapid pressure build-up in closed systems. Decomposition products depend upon temperature, air supply, and the presence of other materials. Avoid contact with oxidizing materials and with clay-based absorbents and sawdust.

Elevated temperatures can cause hazardous polymerization. Polymerization can be catalyzed by aluminum, aluminum chloride, and boron trifluoride.

Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers.

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

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Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of European gasoline blend products manufactured by Dow Benelux BV. 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 Sheet (<http://www.dow.com/aromatics/srh/safety.htm>)
- *European Gasoline Blend Components, Product Data Sheet*, The Dow Chemical Company, Form No. 778-00801, November 2006 (<http://www.dow.com/aromatics/srh/safety.htm>)
- The Dow Aromatics Co-products web site, The Dow Chemical Company (<http://www.dow.com/aromatics/prod/>)
- U.S. Environmental Protection Agency (EPA) – High Production Volume (HPV) Chemical Program, Category Summary for Resin Oils and Cyclo diene Dimer Concentrates Category, submitted by the Olefins Panel of the American Chemistry Council, March 30, 2005 (<http://iaspub.epa.gov/opthpv/quicksearch.display?pChem=100324>)
- European Chemical Substances Information System: <http://ecb.jrc.it/esis/>, search CAS Nos. 68476-55-1 [DOW™ Blend TN120]; 68516-20-1 [DOW Blend TN160]; and 68477-54-3 [DOW Blend TN200] to retrieve information

For more information about DOW European gasoline blend products, see the Dow Aromatics Co-Products web site at www.dow.com/aromatics/prod/.

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References

- ¹ *European Gasoline Blend Components, Product Data Sheet*, The Dow Chemical Company, Form No. 778-00801, November 2006, page 1.
- ² *European Gasoline Blend Components, Product Data Sheet*, The Dow Chemical Company, Form No. 778-00801, November 2006, page 1.
- ³ U.S. Environmental Protection Agency (EPA) – High Production Volume (HPV) Chemical Program, Category Summary for Resin Oils and Cyclo diene Dimer Concentrates Category, submitted by the Olefins Panel of the American Chemistry Council, March 30, 2005, page 14.
- ⁴ Blend TN120, *Provisional Safety Data Sheet*, The Dow Chemical Company, November 24, 2004, pages 2 and 8–9.
- ⁵ Blend TN160, *Provisional Safety Data Sheet*, The Dow Chemical Company, February 1, 2005, pages 2 and 8–9.
- ⁶ Distilled Resin Oil (Blend TN200), *Material Safety Data Sheet*, The Dow Chemical Company, August 23, 2007, page 9.
- ⁷ Blend TN120, *Provisional Safety Data Sheet*, The Dow Chemical Company, November 24, 2004, page 2, 5, and 7.
- ⁸ Blend TN160, *Provisional Safety Data Sheet*, The Dow Chemical Company, February 1, 2005, page 2, 4, and 7.
- ⁹ Distilled Resin Oil (Blend TN200), *Material Safety Data Sheet*, The Dow Chemical Company, August 23, 2007, page 6.
- ¹⁰ *European Gasoline Blend Components, Product Data Sheet*, The Dow Chemical Company, Form No. 778-00801, November 2006, page 1.
- ¹¹ *European Gasoline Blend Components, Product Data Sheet*, The Dow Chemical Company, Form No. 778-00801, November 2006, page 1.
- ¹² Aromatics website: The Dow Chemical Company (<http://www.dow.com/aromatics/prod/>).
- ¹³ *European Gasoline Blend Components, Product Data Sheet*, The Dow Chemical Company, Form No. 778-00801, November 2006, page 1.
- ¹⁴ Blend TN160, *Provisional Safety Data Sheet*, The Dow Chemical Company, February 1, 2005, pages 3–4.
- ¹⁵ U.S. Environmental Protection Agency (EPA) – High Production Volume (HPV) Chemical Program, Category Summary for Resin Oils and Cyclo diene Dimer Concentrates Category, submitted by the Olefins Panel of the American Chemistry Council, March 30, 2005, pages 9–13.
- ¹⁶ U.S. Environmental Protection Agency (EPA) – High Production Volume (HPV) Chemical Program, Category Summary for Resin Oils and Cyclo diene Dimer Concentrates Category, submitted by the Olefins Panel of the American Chemistry Council, March 30, 2005, page 12.
- ¹⁷ Blend TN120, *Provisional Safety Data Sheet*, The Dow Chemical Company, November 24, 2004, pages 8–9.
- ¹⁸ Blend TN160, *Provisional Safety Data Sheet*, The Dow Chemical Company, February 1, 2005, pages 8–9.
- ¹⁹ Distilled Resin Oil (Blend TN200), *Material Safety Data Sheet*, The Dow Chemical Company, August 23, 2007, pages 6–7.
- ²⁰ Blend TN120, *Provisional Safety Data Sheet*, The Dow Chemical Company, November 24, 2004, page 10.
- ²¹ Blend TN160, *Provisional Safety Data Sheet*, The Dow Chemical Company, February 1, 2005, pages 9–10.
- ²² Distilled Resin Oil (Blend TN200), *Material Safety Data Sheet*, The Dow Chemical Company, August 23, 2007, page 7.
- ²³ Blend TN120, *Provisional Safety Data Sheet*, The Dow Chemical Company, November 24, 2004, pages 5 and 7–8.
- ²⁴ Blend TN160, *Provisional Safety Data Sheet*, The Dow Chemical Company, February 1, 2005, pages 4 and 7.
- ²⁵ Distilled Resin Oil (Blend TN200), *Material Safety Data Sheet*, The Dow Chemical Company, August 23, 2007, pages 3 and 6.

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NOTICES:

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