Product Safety Assessment

**DOW™ Natural Gas Condensate**


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**Names**
- CAS No. 68919-39-1
- DOW™ natural gas condensate
- Lease condensate
- Natural gas condensates
- Condensate
- Natural Gas - PM

**Product Overview**
- Natural gas condensate is a complex mixture of hydrocarbons present in raw natural gas. During the natural gas purification process, natural gas condensates are most often removed from the gas stream at the wellhead through the use of mechanical separators. The composition varies based on the origin of the raw natural gas, but consists predominantly of C2 through C8 hydrocarbons, with C6 through C8 hydrocarbons present in the greatest concentrations. DOW™ natural gas condensate is a yellow to brown liquid with a gasoline-like odor. For further details, see **Product Description**.  
- DOW natural gas condensate is used as a feedstock for the production of ethylene. For further details, see **Product Uses**.  
- Occupational exposure to natural gas condensate is possible during extraction, transfer, or use. In chemical manufacturing, natural gas condensate is consumed in closed systems with engineering controls to prevent fugitive emissions. Consumer contact with this material is not likely. For further details, see **Exposure Potential**.  
- Eye contact with liquid natural gas condensate may cause moderate irritation with moderate corneal injury. Frostbite is possible. Condensate vapor may cause mild eye irritation, redness, and slight, temporary corneal injury. Prolonged skin contact with this material may burn the skin. Liquid may cause frostbite upon contact. Prolonged skin contact is unlikely to result in absorption of harmful amounts; however, repeated contact may result in absorption of harmful amounts. Condensate vapor reduces oxygen available for breathing. In confined or poorly-ventilated areas, vapor can easily accumulate and cause unconsciousness and death due to displacement of oxygen. Excessive inhalation may cause anesthetic effects. Natural gas condensate is an aspiration hazard. This material may contain benzene, which has been shown to cause cancer in laboratory animals and humans. For further details, see **Health Information**.

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• The major components of DOW™ natural gas condensate are biodegradable, have a low to moderate tendency to bioaccumulate in the food chain, and range from slightly toxic to very toxic to aquatic organisms on an acute basis. For further details, see Environmental Information.

• Natural gas condensate liquid and vapor are extremely flammable. The vapor is an explosion hazard. Vapors are heavier than air and may travel long distances and accumulate in low-lying areas. Ignition or flashback could occur. This material is stable under recommended storage conditions, but exposure to elevated temperatures can cause decomposition. Avoid static discharge and other ignition sources. Avoid contact with oxidizing materials. For further details, see Physical Hazard Information.

Manufacture of Product

• Production – The 2009 global production of natural gas liquids produced from natural gas processing plants was more than 250 million metric tonnes (550 billion pounds). This amount includes ethane through pentanes plus heavier hydrocarbons. Natural gas liquids may also be produced through crude oil refining.

• Process – Natural gas liquids are present in raw natural gas and recovered during the natural gas purification process through a series of distillations and other purification techniques.

Product Description

Natural gas condensate is a complex mixture of hydrocarbons present in raw natural gas. Another name for this material is “lease condensate” or “condensate.” Pipeline quality natural gas is nearly pure methane. Natural gas condensate is a specific portion or fraction of the natural gas liquids separated (or condensed) from the natural gas stream at the wellhead, and/or from the production, gathering, transmission, and distribution pipelines. In general, natural gas condensate consists predominantly of hydrocarbons in the range of C2 through C8. DOW™ natural gas condensate is a yellow to brown liquid with a gasoline-like odor and consists mainly of hydrocarbons in the C6 to C8 range, with over 30 different compounds ranging from C2 ethane to C11 undecane in concentrations of 1% or greater. Natural gas condensate is not the same material as liquefied natural gas (CAS No. 8006-14-2) or liquefied petroleum gas, LPG (propane, butanes, ethane-propane mixtures, propane-butane mixtures).

Product Uses

DOW™ natural gas condensate is used by Dow as a raw material for the production of ethylene.

Exposure Potential

DOW™ natural gas condensate is used for the production of ethylene. Based on this, the public could be exposed through:

• Workplace exposure – Occupational exposure to natural gas condensate is possible during extraction, transfer, or use. It is manufactured and consumed in closed systems with engineering controls to prevent fugitive emissions. Those working with condensate in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each facility should have a thorough training program for employees and...
appropriate work processes, ventilation, and safety equipment in place to limit unnecessary exposure. See Health Information.

- **Consumer exposure to DOW natural gas condensate** – DOW natural gas condensate is not sold for consumer use. Consumer contact is not likely. See Health Information.

- **Environmental releases** – Since DOW™ natural gas condensate is used in closed systems, the potential for release to the environment is low. However, hydrocarbon compounds like those in DOW natural gas condensate are released to the environment through the manufacture, use, and disposal of many products associated with the petroleum industry and the combustion of gasoline. If released to air the components will degrade within days from exposure to photochemically produced hydroxyl radicals. The compounds have very low solubility in water, and when introduced, will have a tendency to evaporate from water and degrade in the atmosphere. These compounds are biodegradable and will be removed from water and soil environments, including wastewater treatment plants. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Evacuate personnel upwind of the spill. Contain spilled material if possible. Use foam to smother and suppress vapors. Ground and bond all containers and handling equipment. Condensate vapor is a flash-fire and explosion hazard. Eliminate all ignition sources. Ventilate the area. Pump with explosion-proof equipment into suitable and properly labeled containers. Only trained personnel must be involved in clean-up operations. Positive pressure, self-contained breathing apparatus (SCBA) with an approved full-face mask is recommended for emergency work. Use appropriate safety equipment. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Keep people away. Isolate the fire and deny unnecessary entry. Eliminate ignition sources. Use water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam to fight fire. General-purpose or protein foams are preferred. A direct water stream may spread the fire. Stay upwind and out of low areas where fumes can accumulate. This material vaporizes quickly at room temperature. Vapors are heavier than air and can travel long distances and accumulate in low-lying areas. Ignition or flashback could occur. Avoid accumulation of water. The material may travel across the water surface spreading the fire or contacting an ignition source. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Contain fire-water runoff to minimize the potential for environmental damage. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, contact the Dow Customer Information Group.

**Health Information**

**Eye contact** – Eye contact may cause moderate irritation with moderate corneal injury. Frostbite is possible. Pain may be disproportionate to the level of irritation to the eye tissues. Condensate vapor may cause slight temporary eye irritation and corneal injury.

**Skin contact** – Prolonged contact may cause burns with symptoms of pain, severe local redness, swelling, and tissue damage. Liquid may cause frostbite. Drying and flaking of the skin and itching are possible. Condensate may stain the skin. Prolonged contact is unlikely to result in absorption of harmful amounts; however, repeated contact may result in absorption of harmful amounts.

**Inhalation** – Vapor concentrations are attainable that may be fatal with a single exposure. In confined or poorly ventilated areas, vapor can easily accumulate and cause unconsciousness or death due to displacement of oxygen (suffocation). Excessive inhalation may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). Excessive exposure may
cause central nervous system effects including headache, dizziness, drowsiness, anesthesia, and unconsciousness, including death. Excessive inhalation may irritate the upper respiratory tract (nose and throat) and lungs.

**Ingestion** – Natural gas condensate 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. Swallowing large amounts of this material may cause dizziness, drowsiness, and other central nervous system effects. Nausea and vomiting is possible. Aspiration into the lungs may occur during ingestion or vomiting causing lung damage or even death due to chemical pneumonia.

**Repeated exposure** – In humans, repeated exposure to components of natural gas condensate has adversely affected the eyes, blood, bone marrow, and spleen, and central and peripheral nervous systems. In animal studies, exposure to high levels of toluene or xylene has caused hearing loss.

**Cancer information** – Benzene and ethylbenzene, components of natural gas condensate, have been shown to cause cancer in laboratory animals. Benzene is classified by ACGIH (American Conference of Industrial Hygienists) as a Group A1 confirmed human carcinogen.

For more information, contact the **Dow Customer Information Group**.

*Environmental Information*¹⁷,¹⁸

The compounds in DOW™ natural gas condensate are volatile and will evaporate from products containing them. The compounds are nearly insoluble in water and when introduced, will have a tendency to evaporate from water.

The compounds in DOW natural gas condensate are unlikely to persist in the environment. In the atmosphere, the compounds will degrade within days by reaction with photochemically produced hydroxyl radicals. The compounds are biodegradable, which suggests that they will be removed from water and soil environments, including biological wastewater treatment plants.

The compounds in DOW natural gas condensate have a low to moderate potential to accumulate in the food chain, and range from slightly toxic to very toxic to fish and other aquatic organisms on an acute basis.

For more information, contact the **Dow Customer Information Group**.

*Physical Hazard Information*¹⁹

Natural gas condensate liquid and vapor are extremely flammable. The vapor is an explosion hazard and may cause a flash fire. Condensate vapors are heavier than air and may travel long distances and accumulate in low-lying areas. Ignition or flashback could occur. Avoid static discharge and other ignition sources. Electrically bond and ground all containers and equipment before transferring or using this material.

Condensate is stable under recommended storage conditions. Exposure to elevated temperatures can cause product decomposition. Avoid contact with oxidizing materials.

For more information, contact the **Dow Customer Information Group**.
Regulatory Information
Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of DOW™ natural gas condensate. 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.

For more business information about DOW™ natural gas condensate, contact the Dow Customer Information Group at www.dow.com/assistance/dowcig.htm.

References

3 “Natural Gas Condensates,” Substance Registry Services, U.S. Environmental Protection Agency (EPA) webpage, accessed October 2010.
7 “Gasoline, CASRN 8006-61-9,” Hazardous Substances Data Bank (HSDB), National Library of Medicine, TOXNET system, Environmental Fate & Exposure section.


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