Product Safety Assessment

DOW™ Ethane-Propane Mixture

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Names
- DOW™ ethane-propane mixture
- Ethane
- Propane
- Ep mix
- Ethane-propane (Ep) mix
- CAS No. 74-84-0
- CAS No. 74-98-6
- E/P mix

Product Overview
- DOW™ ethane-propane mixture is a colorless, odorless, flammable gas. It is transported and stored under pressure as a liquid. The mixture contains 60–86% ethane and 14–39% propane, plus small amounts of isobutane, methane, and carbon dioxide. For further details, see Product Description.
- DOW ethane-propane mixture is used as a raw material to manufacture ethylene. For further details, see Product Uses.
- Occupational exposure to ethane-propane mixture is possible during extraction, transfer, or use. In chemical manufacturing, the ethane-propane mixture is consumed in closed systems with engineering controls to prevent fugitive emissions. Consumers are not likely to contact this industrial gas blend. For further details, see Exposure Potential.
- Eye or skin contact with ethane-propane in the vapor state is essentially nonirritating. Contact with liquid ethane-propane may cause a frostbite-type injury due to rapid cooling. Ethane and propane in vapor form are asphyxiants. In confined or poorly ventilated areas vapor can accumulate and cause unconsciousness and death by displacing oxygen (suffocation). For further details, see Health Information.
- The ethane-propane mixture must remain under pressure to stay in liquid form. If released to the environment (soil or water), the mixture would vaporize (evaporate) and disperse into the atmosphere, where it would photodegrade (break down by sunlight) within days or weeks. Because the mixture would partition into the atmosphere, even if released to water, biodegradation is not a significant environmental fate pathway. The ethane-propane mixture has a low bioconcentration potential (tendency to accumulate in the food chain), and estimated toxicity data indicate that this mixture is moderately toxic to fish and other aquatic organisms. For further details, see Environmental Information.

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The ethane-propane mixture is extremely flammable in both liquid and vapor form. Vapors are heavier than air and can travel long distances and accumulate in low-lying areas. Ignition and/or flashback may occur. The liquid is stored under pressure. It is stable under normal storage and use conditions. Elevated temperatures can cause this mixture to decompose. Avoid static discharge. Avoid contact with oxidizing materials such as chlorine, halogens, oxygen, and ozone. For further details, see Physical Hazard Information.

**Manufacture of Product**
- **Production** – In 2009, world ethane consumption was estimated at 45 million metric tonnes (100 billion pounds), of which approximately 12 million metric tonnes (26 billion pounds) were for ethane-propane mixtures.
- **Process** – The ethane-propane mixture is separated from natural gas at natural-gas processing facilities by cooling to very low temperatures. Cryogenic turbo-expansion at −73°C to 101°C is the most popular recovery method. The structures of ethane and propane are shown below.

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\begin{align*}
\text{Ethane} & : \quad \text{H}_2\text{C} = \text{CH}_3 \\
\text{Propane} & : \quad \text{H}_3\text{C} = \text{CH}_2\text{CH}_3
\end{align*}
\]

**Product Description**
DOW™ ethane-propane mixture is a colorless, odorless, flammable gas. It is transported and stored under pressure as a liquid. The ethane-propane mixture is recovered from natural gas. Ethane, propane, and butane from natural gas are called natural-gas liquids or liquified petroleum gases (LP gases or LPGs).

**Product Uses**
Ethane-propane mixtures are used primarily as chemical feedstocks to produce ethylene, one of the major chemical building blocks in the chemical industry. Likewise, DOW™ ethane-propane mixture is used in the production of ethylene. Consumption data for the ethane-propane mixture is included in the total for overall ethane consumption.

**Exposure Potential**
Based on the uses for the ethane-propane mixture, the public could be exposed through:
- **Workplace exposure** – Occupational exposure to ethane or propane is possible during extraction, transfer, or use. This mixture is manufactured and consumed in closed systems with engineering controls to prevent fugitive emissions. Those working with the ethane-propane mixture 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 exposure. See Health Information.

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**U.S. Consumption of Ethane(2009)**
- Ethylene production: 99%
- Other: 1%
• **Consumer exposure to the ethane-propane mixture** – The ethane-propane mixture is an industrial gas blend used for chemical manufacturing. Consumer contact is not likely. See Health Information.

• **Environmental releases** – If released to the environment (air, water, or soil), the ethane-propane mixture would quickly disperse into the atmosphere and photodegrade (break down by sunlight) within days or weeks. Because of its volatility, biodegradation is not a significant environmental fate pathway for the mixture in surface environments. Liquid ethane-propane mixture released to water can result in boiling, frothing, and rapid generation of vapor. Liquid ethane-propane mixture released to soil can result in the formation of ice. See Environmental, Health, and Physical Hazard Information.

• **Large release** – Isolate the area until any gas has dispersed. Stop the flow of gas. If available, use foam to smother or suppress vapors. Liquid and vapors are fire and explosion hazards. Vapors may travel long distances and accumulate in low-lying areas. Ignition or flashback may occur. Spills of liquefied gas in water may form ice, which can plug drains and make valves inoperable. Use non-sparking tools in cleanup operations. Ground and bond all containers and handling equipment. Eliminate ignition sources. 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. The public should be warned of any downwind explosion hazard. See Environmental, Health, and Physical Hazard Information.

• **In case of fire** – Do not attempt to extinguish the fire. Stop the flow of product and allow the fire to burn out. Keep people away and isolate the fire area. Stay upwind. If flames are accidentally extinguished, explosive re-ignition may occur. Deny any unnecessary entry into the area and consider the use of unmanned hose holders. Eliminate ignition sources. If available, use foam to smother or suppress vapors. Once product flow has stopped, small fires may be extinguished with a water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. **Warning!** Contact of water with liquefied ethane-propane mixture can result in boiling, frothing, and rapid generation of vapor. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Health Information**

**Eye or skin contact** – Ethane and propane vapors are essentially nonirritating to the eyes or skin. Eye or skin contact with the liquefied ethane-propane mixture may cause a frostbite-type injury due to rapid cooling. The effects may be delayed.

**Inhalation** – In confined or poorly ventilated areas, vapor can easily accumulate and cause unconsciousness or death due to displacement of oxygen (suffocation). Inhaling very high concentrations of propane (greater than 10%) may cause headache, dizziness, anesthesia, drowsiness, and other central nervous system effects. Increased sensitivity to epinephrine and increased myocardial irritability (irregular heartbeats) are also possible.

**Ingestion** – Swallowing this mixture in gaseous form is unlikely. Liquid may cause frostbite of the lips and mouth.

**Repeated exposure** – DOW™ ethane-propane mixture can contain up to 1.5% carbon dioxide. Experiments with humans and animals suggest that continued exposure to atmospheres
containing 1.5% carbon dioxide may alter physiological processes, such as acid-base and electrolyte balance in the blood, calcium-phosphorus metabolism, and neuroendocrine activity.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Environmental Information**

Ethane-propane mixture (liquid or gas) released to the environment (air, soil, or water) would quickly disperse into the atmosphere and photodegrade (break down by sunlight) within days or weeks.

Ethane and propane have very low boiling points, very high vapor pressures, and are insoluble in water. They are gases under almost all environmental conditions. If released to surface water the mixture would rapidly evaporate and disperse into the atmosphere. It would then degrade by photodegradation (exposure to sunlight). Because of its volatility, biodegradation is not a significant environmental fate pathway for this mixture in surface environments.

The ethane-propane mixture has a low bioconcentration potential (tendency to accumulate in the food chain), and estimated toxicity data indicate that it is moderately toxic to fish and other aquatic organisms.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Physical Hazard Information**

The ethane-propane mixture is extremely flammable in both liquid and vapor form. Keep away from heat, sparks, and flame. Vapors are heavier than air and can travel long distances and accumulate in low-lying areas. Ignition and/or flashback may occur. The liquid mixture is stored under pressure. It is stable under normal storage and use conditions. Exposure to elevated temperatures can cause the mixture to decompose. Avoid contact with oxidizing materials such as chlorine, halogens, oxygen, and ozone.

Electrically bond and ground all containers and equipment before transferring or using the ethane-propane mixture.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

**Regulatory Information**

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of DOW™ ethane-propane mixture. 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

- Contact Us ([www.dow.com/assistance/dowcig.htm](http://www.dow.com/assistance/dowcig.htm))
- “Ethane,” Hazardous Substances Data Bank (HSDB), National Library of Medicine, TOXNET system ([http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@na+ETHANE](http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@na+ETHANE))
- “Propane,” Hazardous Substances Data Bank (HSDB), National Library of Medicine, TOXNET system ([http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@na+PROPANE](http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@na+PROPANE))

For more business information about DOW™ ethane-propane mixture, contact the Dow Customer Information Group at [www.dow.com/assistance/dowcig.htm](http://www.dow.com/assistance/dowcig.htm).

References

1. Ethane-Propane Mixture Material Safety Data Sheet, The Dow Chemical Company

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NOTICES:

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