Product Safety Assessment

DOW™ Propylene

Product Safety Assessment documents are available at www.dow.com/productsafety/finder/.

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Names
- CAS No. 115-07-1
- Propylene
- Methylene
- 1-Propene
- Propene
- Methylthene

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Product Overview
- DOW™ propylene is a colorless, flammable gas. For further details, see Product Description.
- DOW propylene is a major industrial chemical intermediate that serves as a building block for an array of chemical and plastic products. For further details, see Product Uses.
- Exposure to DOW propylene can occur either in a manufacturing facility or in the various industrial or facilities that use it. It is produced, distributed, stored, and consumed in closed systems. Propylene occurs in low amounts in the environment from the combustion of fossil fuels. For further details, see Exposure Potential.
- Propylene is not irritating to the skin or eyes in its gaseous state and has low acute toxicity from inhalation. At very high levels, inhalation of propylene can cause anesthetic effects and unconsciousness. For further details, see Health Information.
- DOW propylene is not expected to persist in the environment. Since propylene is a gas, it is expected to migrate to the atmosphere when released into the environment, where it photodegrades. Traces left in soil or water would biodegrade. Propylene is not expected to accumulate in the food chain. For further details, see Environmental Information.
- DOW propylene is flammable. Use good ventilation and avoid all sources of ignition. For further details, see Physical Hazard Information.

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Manufacture of Product
- Capacity – In 2009, global capacity for propylene produced for chemical purposes was about 87.4 million metric tonnes (192 billion pounds). Dow production capacity is about 2.8 million metric tonnes (6.1 billion pounds). Dow ranks in the top 10 global producers of propylene for
Product Description

DOW™ propylene is a colorless, flammable gas. It may be stored or transported as a liquid under pressure. Typically, three grades are available commercially:

- Polymer grade (95–100%)
- Chemical grade (90–99.8%)
- Refinery grade (50–70%, usually recovered from refinery operations)

Product Uses

Essentially all of the propylene produced for chemical purposes is consumed as a chemical intermediate in other chemical manufacturing processes. DOW™ propylene is used to produce polypropylene, acrylonitrile, oxo chemicals, propylene oxide, cumene, isopropyl alcohol, acrylic acid, and other chemicals.

Examples include:

- Propylene glycols for paints, household detergents, and brake fluids
- Polypropylene fibers for indoor/outdoor carpeting
- Polyurethane systems for rigid-foam insulation and flexible-foam seat cushions
- ABS resins for telephones and molded automotive trim parts

In addition to its use as a chemical intermediate, DOW propylene is produced and consumed in refinery operations for the production of gasoline components.

Exposure Potential

DOW™ propylene is used in the production of industrial products. Based on the uses for this material, the public could be exposed through:

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• **Workplace exposure** – Exposure can occur either in a propylene manufacturing facility or in the various industrial or manufacturing facilities that use it. It is produced, distributed, stored, and consumed in closed systems. Those working in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit exposure. See Health Information.

• **Consumer exposure to products containing DOW™ propylene** – Propylene is intended for industrial applications, not consumer use. Since no consumer uses of propylene are known, exposure to commercially produced propylene is unlikely. However, small amounts of propylene are produced naturally in the environment from sources such as vegetation and combustion, and this could present an opportunity for exposure. See Health Information.

• **Environmental releases** – DOW propylene is not expected to persist in the environment. Propylene released to the environment from industrial operations is expected to migrate quickly to the atmosphere, where it would photodegrade. Very low levels of propylene may exist in the environment from the combustion of fossil fuels, space heating, losses from gas plants and refineries, cigarette smoke, and gradual emissions from marine environments. Traces left in soil or water would biodegrade. Propylene is not expected to bioconcentrate. See Environmental, Health, and Physical Hazard Information.

• **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Positive-pressure, self-contained breathing apparatus (SCBA) with an approved full-face mask is recommended for emergency work. Eliminate all sources of ignition immediately. Use only explosion-proof equipment. Ground and bond all containers and handling equipment. See Environmental, Health, and Physical Hazard Information.

• **In case of fire** – Deny any unnecessary entry into the area. Consider the use of unmanned hose holders. Use of a direct water stream may spread the fire. The public should be warned of downwind vapor-explosion hazards. Vapors are heavier than air and may travel a long distance and accumulate in low-lying areas. Keep vapors out of sewers. Immediately withdraw all personnel from the area in case of rising sounds from venting safety devices or discolorations of the container. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

Health Information

**Eye and skin contact** – Since propylene is a gas at normal temperatures and pressures, it is unlikely to contact the skin or eyes. Propylene is not irritating to the skin or eyes in its gaseous state. Eye or skin contact with liquefied propylene may cause frostbite.

**Inhalation** – Studies show that propylene has low acute toxicity from inhalation. Inhalation of propylene gas can cause anesthetic effects or unconsciousness at very high concentrations. However, the asphyxiation limit for humans (236,000 ppm) is about 10 times higher than the lower flammability level.

**Other** – Propylene is not likely to be mutagenic in humans. Further, propylene is not likely to be a cancer-causing substance, as supported by data from National Toxicology Program animal exposure studies. Inhalation exposure studies also showed no maternal, prenatal, or developmental toxicity at concentrations up to 10,000 ppm. In addition, repeated dose inhalation studies showed no significant effects on male or female reproductive organs.

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

Propylene is not expected to persist in the environment. Since propylene is a gas, if released into the environment it is expected to migrate quickly into the air, where it photodegrades. Traces that may remain in water or soil will biodegrade. It is not expected to attach to or be adsorbed significantly by organic matter in soil, sediment, or wastewater solids. Because of its relatively short half-life in the atmosphere and low environmental concentrations, propylene’s contribution to potential global warming is considered minor. Its ozone depletion potential is negligible.

Since propylene dissipates to the atmosphere, aquatic toxicity testing has not been conducted. According to predictive estimates, there is a low potential for propylene to bioconcentrate (accumulate in the food chain).

In the U.S., propylene is considered a volatile organic compound (VOC) and emissions are regulated at the federal, state, or local level. Propylene is not listed by the U.S. Environmental Protection Agency (EPA) as a hazardous air pollutant (HAP) under the Clean Air Act (CAA).

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

Physical Hazard Information

Propylene is flammable and should be handled only in areas with adequate ventilation and where potential sources of ignition have been removed. The lower flammability level for propylene is about 20,000 ppm (2.0 volume % in air).

For more information, request the 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™ propylene. 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 (request from the Dow Customer Information Group: www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/assistance/thoughts.htm)
- U.S. EPA High Production Volume (HPV) Challenge Program, Propylene Streams Category, accessed October 2010 (www.epa.gov/hpv/)

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• “Propylene,” International Programme on Chemical Safety (IPCS) web site, accessed October 2010 (www.inchem.org/documents/icsc/icsc/eics0559.htm)

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

Reference


9 “Propylene,” International Programme on Chemical Safety (IPCS) web site
NOTICES:

As part of its 2015 Sustainability Goals, Dow has committed to make publicly available safety assessments for its products globally. This product safety assessment is intended to give general information about the chemical (or categories of chemicals) addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the relevant Safety Data Sheet, which should be consulted before use of the chemical. This product safety assessment does not replace required communication documents such as the Safety Data Sheet.

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