Product Safety Assessment

UCON™ 50-HB Lubricants (High Molecular Weight)

UCON™ Lubricants 50-HB-2000, -3520, -5100

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Names

- CAS No. 9038-95-3
- Polyalkylene glycol monobutyl ether
- PAGME
- Propylene oxide ethylene oxide polymer monobutyl ether
- UCON™ Lubricant 50-HB-2000
- UCON™ Lubricant 50-HB-3520
- UCON™ Lubricant 50-HB-5100

Product Overview

- The information in this document is valid for higher molecular weight UCON™ 50-HB lubricants, as listed in the Names section. UCON 50-HB lubricants are polyalkylene glycol monobutyl ether polymers. They are colorless to yellow liquids with a mild odor. The solubility of UCON 50-HB lubricants in water changes with temperature. UCON 50-HB lubricants have the unusual property of complete solubility (dissolving easily) in cold water; however, they become insoluble at temperatures greater than 40°C (104°F). For further details, see Product Description.
- UCON 50-HB lubricants are used a variety of applications, including but not limited to: textile-fiber manufacturing lubricant; chemical intermediate; foam control agent; anti-stick, coating agent for the rubber industry; and base polymers for the formulation of specialized lubricants. UCON™ 50-HB lubricants are also used in skin- and hair-care formulations as emollients (softening agents) and solvents. These products should not be used in aerosol applications. For further details, see Product Uses.
- Worker exposure to UCON 50-HB lubricants is possible during manufacturing or industrial use. Because these materials can be used in personal care products, consumer exposure is also possible. For further details, see Exposure Potential.
- Eye contact with the higher molecular weight UCON 50-HB lubricants is essentially non-irritating. Although brief skin contact is nonirritating, prolonged skin contact may cause slight irritation with local redness. Prolonged skin contact is not likely to result in absorption of harmful amounts. These materials have low volatility at room temperature. Prolonged inhalation of heated material or mist may cause serious adverse effects, even death. These products should not be used in aerosol applications. For further details, see Health Information.
- UCON™ 50-HB lubricants are moderately biodegradable and are not expected to accumulate in the food chain. These materials are practically non-toxic to fish and other aquatic organisms on an acute basis.¹ For further details, see Environmental Information.
- UCON 50-HB lubricants are thermally stable at recommended temperatures. Avoid contact with strong acids, strong bases, and strong oxidizers.¹ For further details, see Physical Hazard Information.

Manufacture of Product
- **Locations** – UCON™ 50-HB lubricants are manufactured by Dow at their facility in South Charleston, West Virginia (USA).
- **Process** – UCON 50-HB lubricants are produced by reacting an equal amount by weight of ethylene oxide and propylene oxide with butyl alcohol using an alkali catalyst at temperatures from 100 to 150°C. The result is a random copolymer with the general structure below:

  \[
  \text{Butanol} \quad \text{Propylene oxide} \quad \text{Ethylene oxide} \quad \text{UCON 50-HB Lubricant}
  \]

Product Description
UCON™ 50-HB lubricants are colorless to yellow liquids with a mild odor and low volatility (do not evaporate easily at room temperature). They are water soluble at temperatures below 40°C (104°F). UCON 50-HB lubricants are very high purity (>99%) synthetic polymers made from polyalkylene glycol monobutyl ether (PAGMBE). Individual products vary in their average molecular weight and viscosity. Viscosity is the measure of a liquid’s resistance to flow. Lubricants are named according to their Saybolt viscosity value. For example, product UCON 50-HB-3520 has a viscosity of 3520 Saybolt universal seconds (SUS) at 100°F (37.8°C).

Product Uses
UCON™ high molecular weight 50-HB lubricants can be used for a variety of applications, including but not limited to:
- **Chemical intermediates** – for the manufacture of resins, plasticizers, modifiers, and surfactants
- **Compressor lubricants** – as base fluids in compressor lubricant formulations
- **Antifoam agents** – in boiler water and fermentation processes
- **Personal-care products** – as an emollient (softening agent), solvent or viscosity modifier for moisturizing body lotions, self tanning products, eye-makeup remover formulations, skin toner, and hair treatment / shampoo formulations
- **Rubber lubricants** – as anti-stick agents for uncured rubber, machining lubricants for hard rubber, mold lubricants, and lubricants for rubber packings, o-rings, and seals
- **Textile-fiber lubricants** – for high-speed, high-temperature, synthetic-fiber manufacturing processes such as false-twist texturing. High molecular weight UCON 50-HB lubricants are

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friction-resistant, do not discolor or stain fabrics, and can be removed in conventional scouring processes.

These products should not be used in aerosol applications.


Exposure Potential¹

UCON™ 50-HB high molecular weight lubricants are used for industrial and consumer applications. Based on these uses, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a polyalkylene glycol monobutyl ether manufacturing facility or in the various industrial or manufacturing facilities that use these lubricants. Those working with these materials in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each facility that manufactures or uses this material should have a thorough training program for employees and appropriate work processes and safety equipment in place. For more information, see Health Information.

- **Consumer exposure to products containing UCON 50-HB lubricants** – Because these lubricants can be used in personal-care products such as lotions, self-tanning products, moisturizers, eye-makeup remover, and hair treatment/shampoos, it is possible for consumers to come in contact with them. Always read the product information before use and follow the label/use instructions. For more information, see Health Information.

- **Environmental releases** – Due to their low volatility and high water solubility, UCON 50-HB lubricants released into the environment will tend to remain in water. Because these products are moderately biodegradable, they are expected to be removed by sewage treatment plants. In the event of a spill, the focus is to prevent the material from entering into soil, ditches, sewers, waterways, or groundwater. See Environmental, Health and Physical Hazard Information.

- **Large releases** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, dike the area to contain the spill. The material should be collected in suitable and properly labeled containers, and reprocessed or disposed of properly. Use appropriate safety equipment.

- **In case of fire** – Keep people away. Isolate area and deny any unnecessary entry. Personnel involved in fire fighting should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective fire-fighting clothing or fight fire from a safe distance. Use water fog or fine water spray. Do not use a direct water stream, it may spread the fire. Alcohol-resistant foam (ATC Type) extinguishers are preferred, along with dry-chemical or carbon-dioxide extinguishers. See Environmental, Health and Physical Hazard Information.

For more information, review the relevant Safety Data Sheet.

Health Information¹

**Eye contact** – Eye contact with the higher molecular weight UCON™ 50-HB lubricants is essentially nonirritating. Corneal injury is unlikely.

**Skin contact** – Prolonged skin contact may cause slight irritation with local redness, but is unlikely to result in absorption of harmful amounts.

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**Inhalation** – The higher molecular weight UCON™ 50-HB lubricants are harmful if inhaled. At room temperature, exposure to vapor is unlikely due to low volatility (i.e. these products do not evaporate easily). Prolonged exposure aerosol/mist may cause serious adverse effects, even death. The high molecular weight 50-HB products should not be used in aerosol applications.

**Ingestion** – Higher molecular weight UCON 50-HB lubricants have low toxicity if swallowed. Harmful effects are not anticipated from swallowing small amounts.

**Effects of Repeated exposure** – In animals, effects have been reported on the following organs after exposure to aerosols: Lungs. In multiple studies with different molecular weight UCON 50-HB fluids, there were no significant adverse effects in laboratory animals associated with 2-years of daily dietary exposure.

For more information, see the relevant Safety Data Sheet.

**Environmental Information**

UCON™ 50-HB lubricants have low volatility (do not evaporate easily). Because they are water soluble at room temperature, these lubricants will have the tendency to remain in water with minimal tendency to bind to soil or sediment.

UCON 50-HB lubricants are unlikely to persist in the environment. These compounds are moderately biodegradable which suggests they will be removed from water and soil environments, including biological waste water treatment plants.

UCON 50-HB lubricants are not likely to accumulate in the food chain (their bioconcentration potential is low) and they are practically nontoxic to fish and other aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.

**Physical Hazard Information**

Higher molecular weight UCON™ 50-HB lubricants are thermally stable at recommended temperatures and pressures. Exposure to elevated temperatures can cause these products to decompose. Generation of gas during decomposition can cause pressure in closed systems. Decomposition products depend on temperature, air supply, and the presence of other materials and can include aldehydes, alcohols, ethers, hydrocarbons, ketones, organic acids, and polymer fragments. UCON 50-HB lubricants are incompatible with strong acids, strong bases, and strong oxidizers. Contact should be avoided.

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 UCON™ 50-HB lubricants. 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 Sheets (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/ucon/contact/).
- UCON™ Fluids and Lubricants website: (http://www.dow.com/ucon/index.htm)
- Dow Customer Information Group (http://www.dow.com/assistance/dowcig.htm) or 1-800-258-2436 or 1-989-832-1556 (U.S.) or 1-800-331-6451 (Canada)
- Pulmonary Toxicity of Polyalkylene Glycols, Technical Report No. 55, European Center for Ecotoxicology and Toxicology of Chemicals (ECETOC), ISSN-0773-8072-55, Brussels, Belgium, 1997
- UCON™ Fluids and Lubricants, The Dow Chemical Company, Form No. 118-01346-1101 AMS (http://www.dow.com/ucon)
- UCON™ Base Stocks, The Dow Chemical Company, Form No. 118-01578-1005 AMS (http://www.dow.com/ucon)
- UCON™ Fluids: Unique Formulation Additives that Deliver Emolliency, Solvency, and Smooth Application, Amerchol Corporation (a subsidiary of The Dow Chemical Company), Form No. 324-00179-0305 AMS (http://www.dow.com/personalcare/)

For more business information about UCON™ 50-HB lubricants, visit the UCON™ Fluids and Lubricants website at www.ucon.com.

References

1 UCON™ Lubricant 50-HB-3520 Material Safety Data Sheet, The Dow Chemical Company
2 UCON™ Fluids and Lubricants, The Dow Chemical Company, Form No. 118-01346-1101 AMS
4 Pulmonary Toxicity of Polyalkylene Glycols Technical Report No. 55, European Center for Ecotoxicology and Toxicology of Chemicals (ECETOC), ISSN-0773-8072-55, Brussels, Belgium, 1997
5 UCON™ Fluids: Unique Formulation Additives that Deliver Emolliency, Solvency, and Smooth Application, Amerchol Corporation (a subsidiary of The Dow Chemical Company), Form No. 324-00179-0305 AMS

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NOTICES:

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