Product Safety Assessment

UCON™ Calender Lubricants

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Names

- UCON™ Calender Lubricant 20
- UCON Calender Lubricant 35
- UCON Calender Lubricant 51
- UCON Calender Lubricant 51K

Product Overview

- UCON™ calender lubricants are specially compounded liquids derived from polyalkylene glycol. They are soluble in water, have high viscosity indexes, and are chemically and thermally stable. Four products are available. For further details, see Product Description.
- UCON calender lubricants are designed to lubricate moving and rotating parts on large-scale mills and calendering machines used in the rubber, textile, paper, and plastics industries. For further details, see Product Uses.
- Dow does not sell UCON calender lubricants for direct consumer use, and they are not incorporated into consumer products. Exposure can occur either in a facility that manufactures these products or in industrial facilities that use these products. For further details, see Exposure Potential.
- Prolonged skin contact may result in slight irritation with local redness, but is unlikely to result in absorption of harmful amounts. One minor component has caused allergic skin reactions in animal testing and in humans. Exposure to heated vapor or mist may result in irritation to the upper respiratory tract and lungs. For further details, see Health Information.
- The major component of UCON calender lubricants is biodegradable, not expected to accumulate in the food chain (low bioconcentration potential), and is practically nontoxic to fish and other aquatic organisms on an acute basis. For further details, see Environmental Information.
- UCON calender lubricants are stable at normal storage and use temperatures. Elevated temperatures can cause these products to decompose. Avoid contact with strong acids, strong bases, and strong oxidizers. For further details, see Physical Hazard Information.

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Manufacture of Product

- **Manufacturing** – Dow produces UCON™ calender lubricants in South Charleston, West Virginia (USA).
- **Process** – UCON calender lubricants are produced by blending a copolymer of propylene oxide, ethylene oxide and n-butanol with various performance additives. The general structure of the polyalkylene glycol is shown below.

\[
CH_3CH_2CH_2CH_2O [CH_2CHO]_n [CH_2CH_2O]_m H
\]

Product Description

UCON™ calender lubricants are specially compounded liquids derived from polyalkylene glycol. They are soluble in water, have high viscosity indexes, are chemically and thermally stable, are brown in color, and most have a mild odor. Four products are available, designed with different viscosity ranges and temperature capabilities. The product numbers indicate the viscosity range in which they work best:

- UCON Calender Lubricant 20
- UCON Calender Lubricant 35
- UCON Calender Lubricant 51
- UCON Calender Lubricant 51K

These lubricants are composed of about 95% polyalkylene glycol monobutyl ether (CAS No. 9038-95-3) with N-phenyl-α-naphthylamine (CAS No. 90-30-2) and a proprietary carboxylic acid derivative. UCON Calender Lubricant 51K contains additional minor ingredients.

Product Uses

UCON™ calender lubricants are designed to lubricate moving and rotating parts on large-scale mills and calendering machines used in the rubber, textile, paper, and plastics industries. They remain stable at higher operating temperatures than conventional petroleum-based lubricants and do not develop carbon-based residues over time. Because they are water soluble, they are easier to clean up and are compatible with a wide range of bearings and gearing. UCON Calender Lubricant 51K is especially suitable for lubrication of slow-rotating bronze bushings.

Exposure Potential

UCON™ calender lubricants are used in industrial equipment and do not come into contact with materials sold to consumers. Based on the uses for these products, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a facility that manufactures UCON calender lubricants or in the various industrial facilities that use these lubricants. They are produced, distributed, stored, and used in closed systems. Those working with these products 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, ventilation, and safety equipment in place to limit exposure. See Health Information.
- **Consumer exposure to products containing UCON calender lubricants** – Dow does not sell these products for consumer use, and in industrial use they are confined to use within
closed lubrication systems. They are not incorporated into consumer products. See Health Information.

- **Environmental releases** – Because UCON™ calender lubricants are used in closed systems, the potential for release to the environment is low. The major component of UCON calender lubricants is soluble in water and when introduced, will have a tendency to remain in water. Because this compound is biodegradable, it is expected to be removed from water and soil environments, including sewage treatment plants. In the event of a spill, the response should focus on containment to prevent contamination of soil and surface or ground water. Respiratory protection is recommended for cleaning up spills and leaks. 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. An approved respirator is recommended for emergency work. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Deny any unnecessary entry into the area and consider the use of unmanned hose holders. Isolate the fire. Use water spray or fog, carbon-dioxide or dry-chemical extinguishers, or foam to fight the fire. Alcohol-resistant foams are preferred. Use of a direct water stream may spread the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Immediately withdraw all personnel from the area in case of rising sounds from venting safety device or discolorations of the container. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

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

**Health Information**

Health information for UCON™ calender lubricants is summarized on the relevant Safety Data Sheets. It is important to note that health risks associated with individual products may vary based on their formulation or intended use. The Safety Data Sheet is the preferred source for specific health information. These materials may contain minor components or additives that have additional health risks. An overview of health information for these products appears below.

- **Eye contact** – Contact is essentially nonirritating.

- **Skin contact** – Brief contact is essentially nonirritating. Prolonged contact may result in slight skin irritation with local redness, but is unlikely to result in absorption of harmful amounts. One minor component (≤3%) has caused allergic skin reactions in animal testing and in humans.

- **Ingestion** – These products have very low toxicity if swallowed. Harmful effects are not anticipated from swallowing small amounts.

- **Inhalation** – At room temperature, exposure to vapors is unlikely due to the products’ low volatility. However, prolonged exposure to aerosol/mist may cause serious adverse effects, even death. These products should not be used in aerosol applications.

- **Other** – In animal studies, a minor component of UCON Calender Lubricant 51K, phosphoric acid tricresyl ester (≤1%), has been reported to interfere with fertility in male rats and mice.

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

Environmental information for UCON™ calender lubricants is summarized on the relevant Safety Data Sheets. It is important to note that environmental risks associated with individual products may vary based on their formulation or intended use. The Safety Data Sheet is the preferred source for specific information. These materials may contain minor components or additives that have additional environmental risks.

The major component of UCON calender lubricants, polyalkylene glycol monobutyl ether, is soluble in water with low volatility. Once introduced, this material will have a tendency to remain in water with little tendency to bind to soil or sediment. Several formulations also contain N-phenyl-α-naphthylamine which has low water solubility and low volatility. Once introduced, this compound will also tend to remain in water, but has a moderate tendency to bind to soil or sediment.

Both components are unlikely to persist in the environment. These compounds are biodegradable, which suggests they will be removed from water and soil environments, including biological wastewater treatment plants.

Polyalkylene glycol monobutyl ether is not likely to accumulate in the food chain (bioconcentration potential is low) and is practically non-toxic to fish and other aquatic organisms on an acute basis. N-phenyl-α-naphthylamine has a moderate bioconcentration potential and is toxic to fish on an acute basis.

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

Physical Hazard Information

UCON™ calender lubricants are stable at normal storage and use temperatures. Elevated temperatures can cause these products to decompose. Decomposition may result in gas generation with the possibility of pressure build-up in closed systems. Decomposition products may include aldehydes, alcohols, ethers, hydrocarbons, ketones, organic acids, or polymer fragments. Avoid contact with strong acids, strong bases, and strong oxidizers.

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 UCON™ calender lubricants. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Brochure, or Contact Us.

Additional Information

- Safety Data Sheet (www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/ucon/contact/index.htm)
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For more business information about UCON calender lubricants, visit the Dow web site for UCON Fluids and Lubricants at [www.dow.com/ucon/index.htm](http://www.dow.com/ucon/index.htm) or [www.ucon.com](http://www.ucon.com).

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**References**

2. **UCON Calender Lubricant 51 Material Safety Data Sheet**, The Dow Chemical Company
3. **UCON Calender Lubricant 51K Material Safety Data Sheet**, The Dow Chemical Company
4. **UCON TPEG 500 Material Safety Data Sheet**, The Dow Chemical Company
5. **UCON Fluids and Lubricants – Mill and Calender Lubricants webpage** ([www.dow.com/ucon/formulated/lubricants/mill_cal.htm](http://www.dow.com/ucon/formulated/lubricants/mill_cal.htm))
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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