Product Safety Assessment

UCON™ Water-Glycol Hydraulic Fluids

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Names
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- UCON Hydrolube Concentrate 6439
- UCON Hydrolube Concentrate 6452
- UCON Hydrolube Concentrate 6736
- UCON Hydrolube Concentrate 9001
- UCON ADVANTA™ Hydrolube
- UCON ADVANTA Hydrolube Concentrate
- UCON ADVANTA SC
- UCON ADVANTA USC
- UCON hydrolubes
- UCON Hydrolube DG-732, Dyed
- UCON Hydrolube DG-746, Dyed
- UCON Hydrolube DG-760, Dyed
- UCON Hydrolube HP-5046D
- UCON Hydrolube FG 46

Product Overview
- UCON™ water-glycol hydraulic fluids, or “hydrolubes,” are balanced formulations of a glycol-water base thickened with a water-soluble UCON lubricant. They contain additives to improve lubrication properties and prevent liquid- and vapor-phase corrosion. UCON hydrolubes are fire-resistant and are classified as “FM Approved.” These liquids have an ammonia-like odor, and vary in color from colorless to light yellow to red depending on the formulation. Dow sells both concentrates and finished hydrolubes.¹² For further details, see Product Description.
- UCON hydrolubes are commercial products designed for industrial machinery. Hydrolubes are used as power-transfer media in hydraulic-pump systems. They also provide lubrication and function as sealants and heat-transfer media. UCON hydrolubes are used in agricultural equipment, heavy-duty construction equipment, log-carriage systems at lumber mills, steel company hot-slag haulers, and many other applications. UCON ADVANTA™ hydrolube is specially formulated for use in higher temperature service conditions, such as steel and aluminum mills and die-casting operations.³⁴ For further details, see Product Uses.
- UCON hydrolubes are for commercial use only. Worker exposure is possible at facilities that manufacture these fluids, or during product transport or use. Engineering controls and personal protective equipment reduce exposure risk. Consumers are not likely to contact these products.²⁵ For further details, see Exposure Potential.

¹ Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow
This product safety assessment provides general health information for a family of similar products. For specific health information, consult the product Safety Data Sheet. Eye contact with UCON hydrolube liquid or mist may cause slight, temporary irritation. Corneal injury is unlikely. Brief contact is essentially nonirritating to the skin. Repeated excessive skin contact or skin contact with heated material may result in absorption of harmful amounts. At room temperature, exposure to vapor is minimal. Vapor from heated material or mist in poorly ventilated areas may cause respiratory irritation, headache, or nausea. These products are harmful if swallowed. For further details, see Health Information.

The major components of UCON™ hydrolubes, diethylene glycol and polyalkylene glycol polymers, range from inherently to readily biodegradable, are not expected to accumulate in the food chain (low bioconcentration potential). The major components are practically non-toxic to fish and other aquatic organisms on an acute basis. For further details, see Environmental Information.

UCON hydrolubes are thermally stable at recommended storage and use conditions. Elevated temperatures can cause some components of these formulations to decompose. Avoid contact with strong acids, strong bases, and strong oxidizers. For further details, see Physical Hazard Information.

Manufacture of Product

- **Locations** – Dow is the leading North American supplier of hydrolube concentrates for water-glycol hydraulic fluids. Dow manufactures hydrolube concentrates and fully finished hydrolubes at the facility in South Charleston, West Virginia, USA.
- **Process** – UCON™ water-glycol hydraulic fluids are formulated in batch operations using proprietary Dow materials and technology.

Product Description

UCON™ water-glycol fire-resistant hydraulic fluids, or hydrolubes, are glycol-water formulations thickened with a UCON lubricant. They contain additives to improve lubrication properties and prevent liquid- and vapor-phase corrosion. A key feature of UCON hydrolubes is their fire-resistance. These products are used in high-pressure, high-temperature pump systems in which a hose break or leak is possible. If such a line break or leak occurs, hydraulic fluid is sprayed at high pressure. A combustible fluid could spread flames over a large area. Fire-resistant UCON hydrolubes reduce the chances of a flash fire.

These products have received FM Approval (Standard 6930). Other key features of these products are high-pressure pump performance and all-season usage. They are completely water soluble. Compared to conventional natural oil-based hydraulic fluids, UCON hydrolubes are cleaner and more durable resulting in less pump wear and maintenance. Products are formulated in several viscosity grades in both finished products and concentrates.

Product Uses

UCON™ water-glycol hydraulic fluids are fire-resistant, commercial-grade products designed for industrial machinery. UCON hydrolubes are used for the following applications:
- Agricultural equipment
- Heavy-duty construction equipment
- Log-carriage systems (lumber industry)
- Hot-slag haulers (steel industry)
UCON™ ADVANTA™ hydrolube is specially formulated for use in higher temperature service. Applications include:

- Steel and aluminum mills
- Die-casting operations, foundries
- Mining

Exposure Potential

UCON™ water-glycol hydraulic fluids are used in industrial machinery. Based on the uses for these products the public could be exposed through:

- **Workplace exposure** – Exposure can occur during product manufacture, formulation, or transport, or at industrial facilities that use UCON hydrolubes. They are produced, distributed, and stored in closed systems. Those working these fluids 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 UCON water-glycol hydraulic fluids** – UCON hydrolubes are commercial products for industrial use. They are contained within the hydraulic pump systems of industrial machinery. Consumers are not likely to be exposed to these products. See Health Information.

- **Environmental releases** – Since UCON hydrolubes are used in closed systems, the potential for release to the environment is low. The major components, diethylene glycol and polyalkylene glycol polymers, are highly soluble in water and have low volatility. When introduced, these compounds have a tendency to remain in water. Because these components range from inherently to readily biodegradable, it is expected that they will be removed from water and soil environments, including sewage treatment plants. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, ventilate the area. Contain spilled material if possible. Collect recovered material in suitable and properly labeled containers. Use appropriate safety equipment. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – These products will not burn until the water has evaporated. Keep people away. Isolate the fire and deny unnecessary entry. To extinguish combustible residues of these products, use water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam. A direct water stream may spread the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. 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™ water-glycol hydraulic fluids is provided on the relevant Safety Data Sheet. Health risks associated with individual products may vary based on formulation. These products may contain minor components or additives with additional health risks. The Safety Data Sheet is the preferred source for specific health information.

- **Eye contact** – Contact with these products may cause slight, temporary eye irritation. Corneal injury is unlikely.
Skin contact – Brief contact is essentially nonirritating. Prolonged contact is unlikely to result in absorption of harmful amounts. Repeated contact or massive contact with damaged skin could result in absorption of harmful amounts. Excessive contact with heated material could burn skin and result in absorption of potentially lethal amounts.

Inhalation – At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, a single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor or mist may accumulate and cause respiratory irritation, headache, and nausea.

Ingestion – These products contain diethylene glycol. Ingestion of diethylene glycol is harmful in humans. Symptoms may include nausea and vomiting, abdominal discomfort, and diarrhea. Ingestion of large amounts could cause central nervous system effects, cardiopulmonary effects, kidney failure, and even death.

Chronic (repeated) exposure – In humans, repeated exposure to components of these formulations have adversely affected the kidneys and gastrointestinal tract. These components did not cause cancer in life-time exposure animal studies, and are not genotoxic or mutagenic.

Birth defects – In animals, diethylene glycol has cause toxicity to the fetus and some birth defects at doses that were toxic to the mother.

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

Environmental Information

Environmental information for UCON™ water-glycol hydraulic fluids is summarized on the relevant Safety Data Sheets. These products may contain minor components or additives that have additional environmental risks. The Safety Data Sheet is the preferred source for specific environmental information. An overview of environmental information for the major components appears below.

Diethylene glycol and polyalkylene glycol polymers, the major components of UCON hydrolubes, are highly soluble in water with low volatility. Once introduced, these components will have a tendency to remain in water with little tendency to bind to soil or sediment.

The components of UCON hydrolubes are unlikely to persist in the environment. They range from inherently to readily biodegradable, which suggests they will be removed from water and soil environments, including biological wastewater treatment plants.

The components are not likely to accumulate in the food chain (bioconcentration potential is low), and are practically non-toxic to fish and other aquatic organisms on an acute basis.

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

Physical Hazard Information

UCON™ water-glycol hydraulic fluids are thermally stable under recommended storage and use conditions. Some components of these formulations can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure build-up in closed systems.
Decomposition products may include aldehydes, alcohols, ethers, hydrocarbons, ketones, organic acids, polymer fragments, and other compounds.

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™ water-glycol hydraulic fluids. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Data Sheet, or Contact Us.

Additional Information

- Request the relevant Safety Data Sheet from the Dow Customer Information Group at (www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/ucon/contact/index.htm)
- Dow website – UCON™ Fluids and Lubricants – Water-Glycol Fire-Resistant Hydraulic Fluids (www.dow.com/ucon/formulated/fluids/fire_res.htm)
- UCON Fluids and Lubricants, Brochure, The Dow Chemical Company, Form No. 118-01346-1101 AMS (http://www.dow.com/products/)
- UCON Fluids & Lubricants: UCON Hydrolube HP-5046D, Product Information Sheet, The Dow Chemical Company, Form No. 118-01348-804 AMS

For more business information about UCON hydrolubes, visit the Dow UCON Fluids and Lubricants web site at www.dow.com/ucon/index.htm.
References
2 UCON Hydrolube HP-5046D Material Safety Data Sheet, The Dow Chemical Company
3 UCON™ Fluids & Lubricants: UCON Hydrolube HP-5046D, Product Information Sheet, The Dow Chemical Company, Form No. 118-01348-804 AMS
4 UCON ADVANTA™ Hydrolube Concentrate – Advanced Fire-Resistant Technology for Severe Hydraulic Service Environments, Brochure, The Dow Chemical Company, Form No. 118-01757-508 AMS
5 UCON™ Hydrolube Concentrate 6452 Material Safety Data Sheet, The Dow Chemical Company
7 UCON Fluids and Lubricants, Brochure, The Dow Chemical Company, Form No. 118-01346-1101 AMS

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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