Product Safety Assessment
UCON™ Quenchants and Metalworking Lubricants

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Product Overview
- UCON™ quenchants and metalworking lubricants are polyalkylene glycol-based solutions. Most are yellow in color with a mild odor. Corrosion inhibitors are added to some products. There are six nitrite-containing quenchant products, nonnitrite-containing quenchant products, enhanced quenchant products, and metalworking lubricant products. For further details, see Product Description.
- UCON quenchants are used to control the cooling of a metal from a high temperature to a cooler temperature to facilitate the formation of the desired microstructure and physical properties. Metalworking lubricants are used for formulating water-soluble cutting and grinding fluids and in forming operations. For further details, see Product Uses.
- UCON quenchants are not sold for direct consumer use. Those working with these products in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. For further details, see Exposure Potential.
- Eye contact with these products may result in temporary, slight to moderate eye irritation or corneal injury. Brief skin contact may cause slight to moderate skin irritation with local redness. Some products contain components that have caused allergic skin reactions in animals and humans. Prolonged contact is unlikely to result in absorption of harmful amounts.

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Very low toxicity if swallowed. Repeated ingestion of similar materials has been reported to affect the liver. At room temperature, exposure to vapor is minimal due to low volatility. Sodium nitrite is a component in some products and has additional health concerns. For further details, see Health Information.

- Polyalkylene glycols are the major components of UCON™ quenchants and metalworking lubricants and are biodegradable, not expected to accumulate in the food chain (low bioconcentration potential), and are practically nontoxic to fish and other aquatic organisms on an acute basis. For further details, see Environmental Information.
- Generation of gas during decomposition can cause pressure build-up in closed systems. Store these products in 316 stainless steel, carbon-steel, glass-lined, polypropylene-lined, polyethylene-lined, stainless-steel, or Teflon containers. Avoid contact with strong acids, bases, and oxidizers. For further details, see Physical Hazard Information.

Manufacture of Product

- **Locations** – The base stock of UCON™ quenchants and metalworking lubricants is polyalkylene glycol. These polyalkylene glycols are manufactured by The Dow Chemical Company in South Charleston, West Virginia (USA).
- **Process** – UCON quenchants and metalworking lubricants are formulated in batch operations using proprietary Dow materials and technology.

Product Description

UCON™ quenchants and metalworking lubricant products belong to a family of specialty polymers and corrosion inhibitors. These products are yellow in color with a mild odor, with the exception of UCON quenchant NT-NN, which is a green-to-brown liquid with a mild odor, and UCON metalworking lubricant EPML-X, which is a yellow-to-brown liquid with an amine odor. UCON ULTRAQUENCH™ products have enhanced corrosion protection as well as biocidal and foam control agents. In the United States, UCON quenchants are marketed by Texanol, Inc.

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Product Uses

UCON™ quenchants are used to control the cooling of ferrous (iron containing) and nonferrous (non-iron containing) metals from a high temperature to a cooler temperature to facilitate the formation of the desired microstructure and physical properties. UCON quenchants can be used to replace water, oil, or brine solutions for both low- and high-hardenability in plain carbon and alloy metals for military and industrial products. UCON metalworking lubricants are used for formulating water-soluble cutting and grinding fluids and in forming operations, such as drawing, stamping, and rolling.

Exposure Potential

UCON™ quenchants and metalworking lubricants are not sold for direct consumer use. 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 quenchants and metalworking lubricants or in the various industrial or manufacturing facilities that use these products. They are produced, distributed, and stored 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 unnecessary exposure. See Health Information.
- **Consumer exposure to products containing UCON quenchants and metalworking lubricants** – These fluids are sold only for industrial use. The potential for consumer exposure in finished products is considered negligible. See Health Information.
- **Environmental releases** – The major component of UCON™ quenchants and metalworking lubricants, polyalkylene glycol, is highly soluble in water and has low volatility. When introduced, the material 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 focus is on containing the spill to prevent contamination of soil and surface or ground water. For small spills, material should be absorbed with materials such as sand. 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. Only trained and properly protected personnel should be involved in clean-up operations. 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. Use fine water spray or fog, carbon-dioxide or dry-chemical extinguishers, or foam to fight the fire. Alcohol-resistant foams are preferred. Do not use a direct water stream to fight fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Containers may rupture from gas generation in a fire situation. Immediately withdraw all personnel from the area in case of rising sounds from venting safety device or discolorations of the container. Violent steam generation or eruption may occur upon application of direct stream to hot liquids. During a fire, smoke may contain the original material in addition to toxic and/or irritating combustion products, including carbon monoxide, carbon dioxide, or nitrogen oxides. 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.

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Health Information

Health information for UCON™ quenchants and metalworking 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 products may also contain minor components or additives that have additional health risks. An overview of health information for UCON quenchants and metalworking lubricants appears below.

**Eye contact** – Contact may result in temporary, slight-to-moderate eye irritation or corneal injury.

**Skin contact** – Brief contact may cause slight-to-moderate skin irritation with local redness. Some products contain components that have caused allergic skin reactions in test animals and in humans. Prolonged contact is unlikely to result in absorption of harmful amounts.

**Ingestion** – These products have low toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing larger amounts may cause injury. Repeated ingestion of similar materials has been reported to affect the liver.

**Inhalation** – At room temperature, exposure to vapor is minimal due to low volatility. A single exposure is not likely to be hazardous.

**Other** – Some products contain sodium nitrite (at very low levels, <3%), which can affect the body's ability to transport oxygen or cause central nervous system depression, dizziness and drowsiness, headache or lack of coordination. Sodium nitrite can also affect the heart, liver, spleen, gastrointestinal tract, and testes. In laboratory animals it caused low blood pressure. At very high levels sodium nitrite caused tumors in laboratory animals. At doses that are toxic to the mother, sodium nitrite was toxic to the developing fetus.

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

Environmental Information

The major component of UCON™ quenchants and metalworking lubricants, polyalkylene glycol, is highly 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 triethanolamine and N,N-diethanolamine. These compounds are also highly soluble in water with low volatility. Once introduced, they will have a tendency to remain in water with little tendency to bind to soil or sediment.

The components of UCON quenchants and metalworking lubricants are unlikely to persist in the environment. They are 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). The components are practically non-toxic to aquatic organisms on an acute basis, with the exception that N,N-diethanolamine is toxic to algae.

For more information, request the Safety Data Sheet from the Dow Customer Information Group.
Physical Hazard Information\(^4,5,6,7\)

UCON™ quenchants and metalworking lubricants are stable at normal storage and use temperatures, but may decompose at elevated temperatures. Decomposition products depend on temperature, air supply, and the presence of other materials, but can include aldehydes, alcohols, ethers, hydrocarbons, ketones, organic acids, and/or polymer fragments.

Store these products in stainless steel, carbon-steel, glass-lined, polypropylene-lined, or Teflon containers. Avoid contact with strong acids, bases, and oxidizers. Material spilled on hot, fibrous insulation may reduce the autoignition temperature, increasing the potential for spontaneous combustion.

For more information, request the Safety Data Sheet from the Dow Customer Information Group.
9 UCON Quenchant B Material Safety Data Sheet, The Dow Chemical Company
10 UCON Quenchant E Material Safety Data Sheet, The Dow Chemical Company
11 UCON Quenchant HT Material Safety Data Sheet, The Dow Chemical Company
12 UCON Quenchant RL Material Safety Data Sheet, The Dow Chemical Company
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17 UCON ULTRAQUENCH B Plus Material Safety Data Sheet, The Dow Chemical Company
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20 UCON Metalworking Lubricant EPML-577 Material Safety Data Sheet, The Dow Chemical Company
21 UCON Metalworking Lubricant EPML-X Material Safety Data Sheet, The Dow Chemical Company
22 UCON Fluids and Lubricants- Quenchants Website: www.dow.com/ucon/formulated/fluids/quench.htm.

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