Product Safety Assessment

UCON™ Heat-Transfer, Process, and Solder-Assist Fluids

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

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Names
• Polyethylene glycol
• UCON™ Heat-Transfer Fluid 500
• UCON Solder-Assist Fluid 10
• UCON Solder-Assist Fluid 24
• Polyalkylene glycol
• UCON Process Fluid WS
• UCON Solder-Assist Fluid 26
• UCON Solder-Assist Fluid 25

Product Overview
• This product safety assessment is for UCON™ process fluids, including UCON Heat-Transfer Fluid 500, UCON Process Fluid WS, and UCON Solder-Assist Fluids. These products are specially formulated polyalkylene glycols. They are colorless to yellow or brown liquids that are soluble in water and formulated in a range of molecular weights and viscosities.¹²³ For further details, see Product Description.
• UCON process fluids are used in the heat-treating or processing of plastics, elastomers, thread, or fabricated parts where compatibility of the fluid with the processed part is important. UCON solder-assist fluids are used in printed circuit board manufacturing and assembly. UCON heat-transfer fluids can be used in open, vented heat-transfer systems.³⁴ For further details, see Product Uses.
• Dow does not sell these products for direct consumer use, so consumer exposure is unlikely. Exposure can occur either in facilities that manufacture or formulate these products or in the various industrial or manufacturing facilities that use them. For further details, see Exposure Potential.
• Eye contact may cause slight, temporary irritation, but corneal injury is unlikely. Brief skin contact is essentially nonirritating. Prolonged skin contact is unlikely to result in absorption of harmful amounts. Skin contact with a minor component has caused allergic skin reactions. At room temperature, exposure to vapor is minimal due to low volatility. Very low toxicity is expected if the product is swallowed.⁵⁶⁷ For further details, see Health Information.
• The major components of these UCON process fluids, polyalkylene glycols and derivates, are biodegradable and not expected to accumulate in the food chain (low bioconcentration potential due to high solubility and molecular weight). The acute aquatic toxicity varies with molecular weight of the main components. For further details, see Environmental Information.

- These UCON™ process fluids are stable at typical use temperatures. Exposure to elevated temperatures can cause these products to decompose, generating gas and the potential for pressure build-up in closed systems.\(^5,6,7\) For further details, see Physical Hazard Information.

**Manufacture of Product**\(^8\)
- **Location** – Dow produces these products in South Charleston, West Virginia, USA.
- **Process** – UCON™ base components are formulated with specific additives to generate UCON heat-transfer fluid, UCON process fluid, and UCON solder-assist fluids in batch operations using proprietary Dow materials and technology.

**Product Description**\(^1,2,3\)
UCON™ heat-transfer fluid, process fluid, and solder-assist fluids are specially formulated polyalkylene glycols. They are colorless to yellow or brown liquids. They are water soluble and are formulated in a variety of molecular weights and viscosity ranges.

These UCON fluids differ significantly from petroleum-, animal-, and vegetable oil-based fluids. UCON products feature lubricity and performance over a wide range of operational temperatures.

**Product Uses**\(^4,9\)
UCON™ process fluids are used in the heat treating and processing of plastics, elastomers, thread, or fabricated parts where compatibility of the fluid with the processed part is important. Because they are water soluble, only a water rinse is required to remove residual fluid from parts or other processed material.

UCON solder-assist fluids are used in the electronics industry during printed circuit board manufacturing and assembly.

UCON heat-transfer fluids have characteristics that are superior to petroleum oils of comparable viscosity. Because of their excellent thermal and oxidation stability, they are often used as heat-transfer fluids in open, vented systems. They have high flash- and fire-points, and when properly used, have little tendency to form sludge, carbonize, or foul heat-transfer surfaces. They do not contain polychlorinated biphenyl compounds (PCBs).

**Exposure Potential**\(^5,6,7\)
UCON™ heat-transfer fluid, process fluid, and solder-assist fluids are used in the production of industrial products. Based on the uses for these products, the public could be exposed through:
- **Workplace exposure** – Exposure can occur either in facilities that manufacture or formulate these products or in the various industrial or manufacturing facilities that use them. They are produced, distributed, stored, and consumed 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.

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• Consumer exposure to products containing UCON™ heat-transfer fluid, process fluid, and solder-assist fluids – Dow does not sell these products for direct consumer use, so consumer exposure is unlikely. See Health Information.

• Environmental releases – 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, these products should be absorbed with materials such as sand. These products have low volatility and high solubility in water. If released to water, the major component of these products is biodegradable and would be removed in wastewater-treatment facilities. 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 product should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. 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 to fight the fire from a distance. Use water spray or fog, carbon-dioxide or dry-chemical extinguishers, or foam to fight the fire. Alcohol-resistant foam is 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.
Environmental Information

Environmental information for UCON™ heat-transfer fluid, process fluid, and solder-assist fluids is summarized on the relevant Safety Data Sheets. These products may contain minor components or additives that may have additional environmental risks. The Safety Data Sheet is the preferred source for specific environmental information. An overview of environmental information for the main components of these products appears below.

UCON heat-transfer fluid, process fluid, and solder-assist fluids have low vapor pressure and high solubility in water. Product released to water or soil would tend to remain in water and would not volatilize to the air.

The major polyalkylene glycol components of these UCON fluids are unlikely to persist in the environment. The components range from slowly to readily biodegradable, and are expected to be removed from water and soil environments, including biological wastewater-treatment plants.

Because of their high molecular weight and high water solubility, bioconcentration (accumulation in the food chain) of these substances would not be expected. The acute toxicity of the main components of these products varies by molecular weight. As the molecular weight of the main component increases, the toxicity decreases. The toxicity ranges from practically non-toxic with higher molecular weight components to toxic with lower molecular weight components. The preferred source of detailed information about toxicity is the relevant Safety Data Sheet.

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

Physical Hazard Information

UCON™ heat-transfer fluid, process fluid, and solder-assist fluids are stable at typical use temperatures. Exposure to elevated temperatures can cause these products to decompose, generating gas and the potential for pressure build-up in closed systems. These products are not corrosive and can be stored in carbon-steel tanks. Avoid contact with strong acids, bases, and oxidizers.

These products absorb water. If low moisture content is critical, precautions should be taken to prevent atmospheric moisture from entering the storage tank. A desiccant unit can be installed on the vent line or the tank can be blanketed with dry air or nitrogen.

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™ heat-transfer fluid, process fluid, and solder-assist fluids. 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.

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Additional Information

- Safety Data Sheet (request from the Dow Customer Information Group: [www.dow.com/assistance/dowcig.htm](http://www.dow.com/assistance/dowcig.htm))
- Contact Us ([www.dow.com/ucon/contact/index.htm](http://www.dow.com/ucon/contact/index.htm))

For more business information about UCON™ heat-transfer fluid, process fluid, and solder-assist fluids, visit the Dow UCON Fluids and Lubricants web site at [www.dow.com/ucon/](http://www.dow.com/ucon/).

References

5. UCON™ Solder Assist Fluid 25 Material Safety Data Sheet, The Dow Chemical Company
6. UCON Process Fluid WS Material Safety Data Sheet, The Dow Chemical Company
7. UCON Heat Transfer Fluid 500 Material Safety Data Sheet, The Dow Chemical Company

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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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