Introduction

The following information is provided in answer to the most frequently asked questions about hydraulic system operation with water-glycol hydraulic fluids. Since there may be exceptions to any general statement, please contact your equipment supplier and The Dow Chemical Company if you have specific questions.

Pumps

Hydraulic pumps should not be operated above their recommended flow rate. Pump inlet vacuum should be measured and should meet recommendations for that pump with water / glycol hydraulic fluids. For example, a maximum of five (5) inches of mercury inlet vacuum is a typical target recommendation used by some pump manufacturers. Generally, lower inlet vacuum prolongs pump life. The proper inlet size recommended by the pump manufacturer for the fluid class (in this case water / glycol) and specific gravity should be used.

Fluid Reservoir

A pressurized reservoir is recommended for optimal performance and to minimize the potential for starving the pump inlet. The hydraulic fluid reservoir should be positioned to gravity feed hydraulic fluid to the pump inlet – often called the “flooded inlet”. Alternatively, a supercharging pump may be used to feed fluid to the inlet. The tank return line should be positioned well beneath the fluid’s surface to reduce air contamination. A baffled reservoir is strongly recommended to prevent vortex-promoted contamination.

Filters

Paper filters must be replaced with water-resistant or fiberglass filters. Whatever filter is selected must be compatible with UCON Hydrolubes. The user should review filter compatibility with the filter supplier before use. The use of cellulosic filters is unacceptable. Filtration recommendations required by the component manufacturer should be followed. For many systems, a 10-micron filter is adequate. Filters should be positioned between the pump outlet port (pressure side) and the reservoir return line.

Seals

UCON Hydrolubes can be used with many common rubber compounds, such as Buna N, that are recommended and used for petroleum oils. However, Buna S and polar elastomers such as polyurethane should not be used. Most Viton, but not all, and EPDM elastomers are the most commonly recommended seal materials for UCON Hydrolubes. However, it must be noted that there are often significant variations in the materials used for compounding these elastomers. Therefore, always confirm the compatibility of hydrolubes with the seal manufacturer before use.

A certain amount of swelling is generally desirable to facilitate a good seal. However, if the seal material were to undergo a small amount of shrinkage, it is possible to use a slightly larger seal to account for such expected shrinkage. Although both “Teflon” and silicone seal materials are compatible with UCON Hydrolubes, they do not swell significantly. In fact, silicone undergoes considerable shrinkage. Therefore, the hydraulic systems must be tightened sufficiently to minimize potential leakage.
**Bearings**

There are no restrictions on externally lubricated bearings. Of internally lubricated bearings, sleeve and journal bearings work best. Ball and roller bearings are also acceptable. However, needle bearings are not recommended.

**Fluid Coolers**

Fluid coolers should be used to maintain the UCON Hydrolube below 150°F (65°C). Cooler operating temperatures improves fluid lubricity and reduces fluid maintenance by reducing water evaporation.

**Aluminum Compatibility**

The use of anodized aluminum is usually recommended for use with hydrolubes. Contact the manufacturer for guidance regarding water/glycol systems compatibility.

**Fluid Maintenance**

It is essential to perform periodic fluid maintenance to assure that water content and reserve alkalinity are within the recommended acceptable range. Use only deionized, distilled, or boiler-water condensate with a conductivity of 15 µmhos or less for soft water make-up additions.

**Pump Down-Rating**

Due to the relatively high specific gravity of UCON Hydrolubes, some hydraulic pumps may be down-rated by a pump manufacturer because of insufficient mass flow through the pump inlet. However, this potential limitation is often readily minimized by one of the following options: supercharging the inlet with another pump or pressurizing the reservoir. Consult the pump manufacturer to determine the proper course of action.

**Product Stewardship**

Dow encourages its customers and potential users to review their applications from the standpoint of human health and environmental aspects. To help ensure that Dow products are not used in ways for which they are not intended or tested, Dow personnel will assist customers in dealing with environmental and product safety considerations. Dow literature, including Material Safety Data Sheets, should be consulted prior to use.

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