

## **Oil Changes and Oil Level**

### **Developing a Maintenance Schedule**

After studying many examples of pump failure, Welch has found the most common reason is poor condition of the oil. This is why a regular maintenance schedule for the oil is critical to obtain the longest service life out of your DUOSEAL pump. Welch recommends that you examine the condition of the oil on a daily basis in the early days of a new process or experiment. You want to look for discoloration of the oil and whether the oil level is rising. The discoloration can indicate deterioration of the oil and a rising oil level can indicate condensation of vapors is occurring in the pump. When changes occur, the oil needs to be changed. If no changes in the oil level or color are observed, extended pump service life is obtained if the oil is changed every three to four months.

### **Forced Oil Flushing**

When you drain oil through the drain valve, you are not removing the oil and contaminants that are inside the pumping mechanism. You are removing oil only from the oil case. Welch recommends a forced oil flush of DUOSEAL pumps be performed at the regular maintenance oil change. The procedure for the forced oil flush is given below.

#### **Forced Oil Flushing Procedure**

1. Check the oil level, if the oil level is well above the fill mark, (This may indicate either the pump has been overfilled with oil or has ingested a liquid or a large amount of vapor water or organic solvents.) Please go to step 2. If the oil level is even with the fill mark and you do NOT suspect corrosive gases or particulates (hence forth called contaminants) ingested have damaged the mechanism, run the pump for 15 minutes to allow the pump oil to warm up before going to step 2.
2. Turn off motor for the vacuum pump. Drain the oil into a clear plastic container (may need pliers to open drain valve). Look for contaminations settling to the bottom of container. If you see contaminants, you will need to repeat step 3 through 5 several times until the oil comes out clear. The oil you drained from the pump came from the oil case only. There may be contaminants in the pumping mechanism. To be sure all contaminants have been removed, the pump mechanism needs to be flushed.
3. Make sure the belt guard is installed before proceeding further. Attach a short hose to the drain valve which runs into a clear plastic container.
4. Flushing the pump is carried out by adding a cup of DUOSEAL vacuum pump oil through the intake port (IN) while the pump is turned on for 15 to 20 seconds. While adding the pump oil, the palm of your hand is placed lightly over the exhaust port (OUT). Look for water coming out of the drain. Turn off the pump.
5. Repeat step 4 until clean oil comes out of the drain hose.
6. Close the drain valve and fill the pump with the amount of DUOSEAL vacuum pump oil your pump needs.
7. Plug the intake (IN) port with a rubber stopper. Turn the pump on and run the pump for 10 minutes. Close the gas ballast.
8. Check the vacuum reading of the pump by connecting a thermocouple gauge tube to the pump's intake. If the pump is running nearly as good as when it was new, the total pressure reading you will read on either of these two gauges will be at least 10 micron.

A simple way to connect the gauge tube to the pump is to run the threaded tip of tube through a hole in a rubber stopper. Use pump oil as a lubricant for inserting the tube. The stopper chosen should be bigger than the outer diameter of the intake flange.

#### **Refilling The Pump**

After you are satisfied that the pump has been thoroughly flushed, refill the pump by pouring new DUOSEAL oil into the exhaust port. Fill to the indicated level and start the pump with the intake closed. A gurgling noise is characteristic when high pressure air is drawn through the pump. It should disappear quickly as the pressure within the pump is reduced. If gurgling continues, add sufficient additional oil through the exhaust port until gurgling ceases.