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Does a Closed Loop Require Water Treatment?

There are assumptions about closed systems. Closed systems are sealed off from the atmosphere and circulate the same body of fluid all the time. Therefore, the water is stable and doesn't require any maintenance.

The effects on a closed loop system used for any kind of heating or cooling are the same, corrosion, wear of components and loss of heat transfer efficiency.

What causes this?

- Dissolved oxygen in the water. Mild steel and iron corrode under these conditions releasing small flakes of rust into the circulating water. These particles are abrasive and tend to erode the components of the system. This can be particularly harmful in the area of pump shaft seals.

Won't the system become stable once the oxygen has been used up?

- Most closed loops are not closed. There has to be provisions made to automatically compensate for any pressure changes or water losses. To accomplish this, the system will normally utilize an expansion tank and relief valve, at the same time being connected to the water main via a pressure-reducing valve, (PRV). Expansion tanks usually have a volume of air trapped above the water. The oxygen dissolves in the water and is then circulated throughout the system. Makeup water enters the system because of bleeding air from the loop or because of water leaks, bringing with it a fresh supply of dissolved oxygen. Sometimes quite substantial leaks or losses can go undetected for a long time since the PRV automatically makes up for them.

How can you tell whether a system has problems?

- Check the color and clarity of the water. It should be almost clear and colorless. Dark brown or black water indicates a serious corrosion problem. There should be very few solid particles collecting at the bottom of the sample container

How do you apply a treatment program?

1. A closed loop treatment program should provide the following: pH control, overcoming the effects of raw water supply is accomplished by a suitable pH additive.
2. Corrosion inhibitor-By coating all internal surfaces of piping and equipment with a protective film, we ensure that corrosion is greatly reduced.

What else can be done to protect a closed loop system?

- Start with a clean system. If the loop contains dirty water and large amounts of rust and mill scale, clean and flush it using a purging compound designed for the purpose. A corrosion inhibitor will provide protection to all parts of the system and heat-transfer equipment will operate at design efficiency.