**Treatment of Closed and Glycol Loop**

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The presentation dealt with the different types of treatment associated with closed systems, as well as ethylene andpropyleneglycol.

Essentially, there are three different types of treatment currently being used in the market place: Sodium Molybdate, Sodium Nitrite, and All-Organic. There are advantages and disadvantages to all three treatments, which we discussed. Molybdate based treatments are low in dissolved solids and are not a nutrient for bacteria. The disadvantage, however, is that molybdenum is a heavy metal, which raises certain environmental issues. Nitrite based products are higher in dissolved solids and are a nutrient for bacteria, however, the nitrite is not a heavy metal. Both are proven corrosion inhibitors and work well. The newest of the treatments is the All-organic type. It was developed to deal with the environmental concerns. Unfortunately, the technology is not completely proven yet.

Next, we discussed the differences between propylene and ethylene glycol. Ethylene is the most widely used glycol as it is a bit cheaper than propylene. Ethylene is considered to be toxic, whereas propylene is not. Both varieties are available in inhibited and uninhibited. inhibited glycol is usually chosen over uninhibited to protect your system when the glycol eventually breaks down. When glycol breaks down, it forms acidic by-products which lower the pH of the system, which causes corrosion. The inhibitors added are buffering agents for thiis specific purpose. Both inhibited and uninhibited glycol is normally overlaid with separate corrosion inhibitors to provide extra corrosion protection to the system.

The symptoms for glycol breakdown are as follows:

**1. Discolouration to an amber or brown
2. The pH drops
3. Conductivity rises
4. Glycol percentage drops somewhat**

One final note for your glycol systems is to watch for bacteria. At low percentages, glycol (ethylene and propylene) is a nutrient for bacteria. Originally, it was thought that 20% was the percentage required to keep bacteria from your system, however, recent research has found certain strains that can survive beyond 20%. The systems are similar to glycol breakdown, and you will also see signs on your side stream filters and corrosion coupons.

Here is a chart referring ethylene glycol percentages with freeze protection:

|  |  |
| --- | --- |
| % Ethylene Glycol | Freeze Protection °C |
| 25 | - 12 |
| 30 | - 16 |
| 35 | - 20 |
| 40 | - 25 |
| 45 | - 31 |
| 50 | - 37 |
| 55 | - 45 |
| 60 | - 52 |