
# Case History Spotlight #225: Reducing Closed Loop Pitting Corrosion

A tire manufacturer in the midwestern United States was experiencing corrosion in one of its closed loop systems where a molybdate corrosion inhibitor and non-oxidizing biocide were used. The water had a distressing appearance and a high level of dissolved and particulate iron. The East Temperature Control Unit (TCU) in question returned hot process water (140 °F [60 °C]) to the sump before the heat exchanger cooled it. Because of this high temperature and the aeration of sump water, oxygen-pitting corrosion was the suspected mechanism. To test this hypothesis, corrator equipment was installed in the corrosion coupon bypass rack to measure the corrosion rate before and after the addition of a Cortec® VpCI® corrosion inhibitor.

While the general corrosion rate was 0.2-0.4 mpy (in the acceptable range) prior to adding the VpCI® inhibitor, pitting was very high at 2.9-5.4 mpy. This supported the theory that dissolved oxygen pitting was at work. A day after adding S-69 P along with a defoamer, general corrosion was around the same level, but pitting was significantly lower at 0.2 mpy. Based on the results, a new product was formulated using S-69 P as a building block. This was added along with new water to the closed loop after filtering out iron fouling and flushing out the old water. Two years of treatment with the S-69 P based formulation resulted in satisfactory corrosion rates for the customer.

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***Keywords: pitting corrosion, Case History Spotlight, heat exchanger, corrosion inhibitors for closed loops, molybdate water treatment, molybdate corrosion inhibitor, oxygen pitting, high iron levels in closed loop system, Cortec, VpCI***

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