



May 16th 2011

The Greif Riverville Paper Mill in Riverville, Virginia (www.greif.com) implemented *HydroFLOW* water conditioners in order to control the buildup of scale in the paper production process. Over one year ago, the Paper Mill's maintenance staff installed approximately fifteen water conditioners in various locations of high mineral concentrations. The Paper Mill's Senior Maintenance Engineer found the water conditioners to be a more viable and cost effective method of managing scale problems over traditional maintenance practices.

One of the byproducts of papermaking is the generation of high concentrations of calcium carbonate, sodium carbonate and sodium sulfate in the process water. Due to the high concentrations of these minerals; scale deposits coat the inside of pipes, pumps and heat exchangers, restricting flow and heat transfer efficiency. Typically, pipes and equipment need to be disassembled and cleaned (by hydro-blasting) approximately every 6 months. Common applications in paper mills are white liquor piping, green liquor piping, evaporator piping, cooling towers, boilers, heat exchangers and washer nozzles.

Conclusions by the Paper Mill's Senior Maintenance Engineer:

- a. The water conditioners kept the pump impeller housings clear of scale build up, improving flow rate and extending pump life.**
- b. The water conditioners have a positive effect on heat exchanger performance by breaking-up the scale deposits on the internal tubes thus increasing heat transfer efficiency.**
- c. The water conditioners kept piping clear of most scale deposits and made existing deposits easy to remove.**
- d. The return on investment, due to decreased maintenance labor and power usage is approximately one year.**

In order to receive a verbal testimony from the Paper Mill's Senior Maintenance Supervisor, please contact our dealer in Virginia, Carotek Inc.

Contact person: Jimmy Angel
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Installed water conditioners

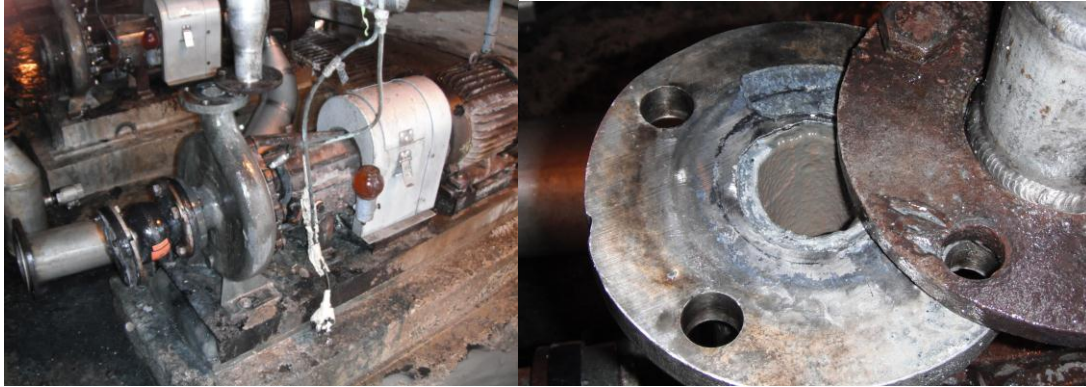


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Comparison between treated and untreated applications



Untreated pump



Treated Pump



Untreated pipe

Treated pipe

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