

# CASE STUDY



## PIPE CORROSION

### ADDITIVE CPN

#### CHALLENGES

- » A major pipe manufacturer was experiencing premature coating failure on coated pipes in the yard
- » Nearly 500 bundles exhibited a high degree of surface oxide failure on the top pipes.

#### THE SOLUTION

To pinpoint the issue, Quaker worked closely with the management to find the cause. Fluid samples were collected from the coolant pits and water treatment sections of the production line and tested on clean pipe pieces and Q-panels. The results revealed:

- » Pipes at the beginning of the process were free of oxide
- » Pieces after the ultrasonic testing oxidized to a scale level 2 and 3
- » Oily contaminants were identified on the surface which had an adverse effect on the overall coating adhesion
- » The heat treated pipes arriving to the coater had a high level of oxide

It was determined that the root cause of the severe rusting was linked to the water treatment used for quenching after the heat treatment step. Quaker advised to add ADDITIVE CPN to boost the corrosion protection of the metalworking fluid solutions.

- » The test results conducted on the water used in the quenching process shows that there was a high content of dissolved ions with high conductivity and neutral pH which provided an estimation that the Langelier index was negative and an indication that this type of water tends to be corrosive
- » Furthermore, the Ryznar index measured at 7.62 which signals a highly corrosive media due to the high concentration of calcium and bicarbonate ions in solution. Based on this observation, it was determined (according to the Nerst equation) that iron will corrode spontaneously under these conditions. In summary, these reactions were being driven by the state of the pipe producer's ground water

ADDITIVE CPN was implemented resulting in:

- » Improvement in the foaming of the overall system
- » Elimination of oxidation on the pipes
- » Avoidance of many hours of re-processing pipes
- » Improved manufacturing quality

ADDITIVE CPN addressed related issues occurring at other process lines in the plant where its addition solved the corrosion issues under the similar water conditions.

Additionally, Quaker provided services to monitor concentration control and testing as well as their technical expertise.

# CASE STUDY

## PIPE CORROSION

### ADDITIVE CPN



Pipes with corrosion before ADDITIVE CPN use



Oxide free pipes with the implementation of ADDITIVE CPN

### THE PRODUCT

ADDITIVE™ CPN is a synthetic corrosion inhibitor for machining and grinding fluids which has been designed to increase the corrosion protection of used, water soluble, metalworking fluids. It is a blend of amine borates and mixed acids and best suited for true solutions synthetics and semisynthetics. Product benefits include:

- » Water based solution assures no concerns for flash/fire point
- » Easy to mix, low applied cost of use
- » Corrosion protection to provide a temporary boost to the corrosion package of the used metalworking fluid
- » Does not leave tacky residues at the proper use concentrations
- » Excellent solubility in aqueous solutions and in emulsion
- » Quickly disperses for immediate corrosion protection
- » Compatibility - Components are highly compatible with most solution synthetics and semi-synthetic products

### THE EXPERTISE

Quaker is a worldwide developer, producer and marketer of custom formulated Tube & Pipe process chemicals and coatings. From first coil to final cut, Quaker is capable of providing process chemicals for all operations in welded and seamless mills, and delivers the in-depth process expertise to help maximize your productivity.

Quaker's product line includes fire-resistant hydraulic lubricants, high-temperature greases, cleaners, forming & sizing coolants, drawing & forming compounds, sawing lubricants, hydrotesting compounds, corrosion preventives, and a complete line of high-value coatings (including solvent, water-based and UV coatings).

### PROCESS AND EQUIPMENT

PROPERTY	TYPICAL VALUE
Part	Seamless Pipe
Concentration	3%
Specific Operation	Quenching