Advanced Material Technologies

Providing Solutions, Delivering Results!

ABN:17-949-415-002

APRIL 2011

SUPERIOR WATER CONDITIONERS FOR BOILERS

PROTECT YOUR BOILER, HEATING SYSTEM, OR COOLING SYSTEM FROM LIME SCALE AND CORROSION.

With the ever increasing cost of fuel today, companies cannot afford to waste energy. A proper water treatment program can yield substantial savings in both time and money.

When water temperature changes, minerals precipitate in the form of hard, brittle scale that collects in piping and on heat transfer surfaces. This insulating scale build-up reduces efficiency of equipment, increases fuel requirements, and increases maintenance time and costs. According to the National Institute of Science and Technology Standards Div., just 1/16 inch of scale on a heat transfer surface requires 15% more energy and 1/2 inch of scale demands 70% more energy.

Maintaining scale-free surfaces assures optimum heat transfer coefficients, enabling maximum benefits from your equipment.

Superiorized® water controls the formation of scale and corrosion deposits without the use of hazardous and costly chemicals. Because no chemicals are used, discharged water is non-polluting and is not hazardous to the environment. By passing water through Superior's alternating magnetic fields, the minerals are forced to stay suspended in the water so they cannot form a hard brittle scale. They are kept in a soft, amorphous powder form.

This amorphous powder deposits a thin film of aragonite talc on the inside of pipes and the water side of condensers which prevents free oxygen in the water (one of the most common causes of corrosion) from attacking the metal surfaces. Excessive solids settle to the bottom of the system in a soft, purge-able form that is easily removed through manual or automatic bleed-offs.

NO SALTS OR ACIDS ARE USED.

Superior produces units specifically designed for hot water or steam heating systems from less than 5 to more than 2,500 horse power, and for cooling from fractional to more than 50,000 tons.
Countless manufacturing processes rely on water, often for thermal management. Superior Water Treatment can lead to dramatic savings (maintenance, chemicals, water, waste transportation, and analytical costs) in the vast majority of these situations.

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In all cases these benefits are realized:

- PREVENTS SCALE FORMATION
- SOFTENS & LOOSENS EXISTING SCALE
- CONTROLS CORROSION
- REDUCES WHITE RUST
- MINIMIZES MAINTENANCE
- ELIMINATES THE NEED FOR CHEMICALS
- SAVES THE ENVIRONMENT

SHEET FINISHING LINE

One of the most important processes in a sheet finishing line is the final rinse section, which is usually supplied with mill service water. In most cases, the original source of the mill service water is a river, lake or sometimes a well. Plugging of rinse header nozzles with lime scale can occur, which adversely affects product quality. The use of chemicals to control the lime scale problem associated in the rinse water process can add to the problem.
The rinse section of a sheet finishing line is an excellent application for the magnetic non-chemical water conditioner, and several mills throughout the world have utilized this process for several years. An additional benefit is that the rinsing and drying of the strip is better and faster because a properly designed unit can reduce the surface tension of the rinse water.

CONTINUOUS ANNEALING LINE

Using conditioners on jet coolers on process lines is another application for this technology. The annual cost of chemicals to treat jet coolers on a continuous annealing line at one plant was approximately $40,000. The service water is taken from a river and is high in total dissolved solids. Even with the use of chemicals, the line experienced thermal problems, especially on heavy gauge products, due to scale deposition in the coolers. The line would have had to be slowed down to achieve proper cooling of the product, which reduced productivity. Motor bearing failures were also experienced on the line that used the same water for bearing cooling.
A non-chemical water conditioner was installed in the jet cooler and motor bearing water supply line in the latter part of 1994. The treatment system was designed to condition 350 to 1150 gpm needed for cooling both light and heavy gauge products. The use of chemicals was discontinued to evaluate the system. No thermal problems were experienced on the line during a heavy load period associated with hot summer conditions, and there were no motor bearing failures.

ELECTRICAL MOTOR ROOM

Electrical motor room - At another steel plant, a 60-in. hot strip mill was plagued with lengthy electrical delays because of inadequate motor room cooling during the summer months when ambient air and water temperatures were high. Every summer, expensive counter-measures had to be used to cool the motor room equipment. The capacity of the heat exchangers and other cooling systems was adequate, but a lime scale build-up occurred that would plug the cooling systems. The mill service water was taken from a river. A heat exchanger before the installation of the magnetic water conditioner is shown in Fig. 1.

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During 1994 and 1995, a total of eight non-chemical magnetic water conditioning units were installed in the motor room. One unit was installed to condition water to the transformer, rectifier and motor generator bearings; six units were installed on the different motor room cooler heat exchanger systems. Total water capacity of these seven units was 2615 gpm.

Six months after the installation, during one of the hottest summers on record, no mill delays were attributed to motor room cooling. As a result of this performance, the eighth conditioner, rated at 30

gpm, was installed on the mill computer room air conditioning unit, and the supply water to the air conditioner was changed from potable to service water.

After approximately one year of service, the inspection plates were removed from some of the motor room coolers and inspected. The tubes were free of hard calcite deposits, but there was a build-up of soft mud, which was easily removed by flushing the tubes with a water hose. A heat exchanger, after one year of service, is shown in Fig. 2; a heat exchanger washed by a water hose is shown in Fig. 3.

MODEL SPECIFICATIONS FOR HVAC & INDUSTRIAL PROCESS APPLICATIONS

Model No.	Application	Capactiy	Inlet-Outlet Connections	Diameter	Length	Weight
RT-500	Small Boiler	4 GPM	1/2" NPT	1 1/2"	12 5/8"	4 lbs.
RT-750	Small Boiler	8 GPM	3/4" NPT	1 3/4"	13"	5 lbs.
RT-1000	Small Boiler	15 GPM	1" NPT	2 1/4"	13 1/2"	7 lbs.
SF-1250-AC	Boiler	30 GPM	1 1/4" Flange	6"	19 3/8"	27 lbs.
SF-1500-AC	Boiler	50 GPM	1 1/2" Flange	7 1/2"	23 3/4"	51 lbs.
SF-2000-AC	Boiler	75 GPM	2" Flange	8 1/2"	28"	68 lbs.
SF-2500-AC	Boiler	110 GPM	2 1/2" Flange	9"	31"	82 lbs.
SF-3000-AC	Boiler	175 GPM	3" Flange	10"	35 5/8"	117 lbs.
SF-4000-AC	Boiler	250 GPM	4" Flange	11"	39 3/4"	170 lbs.
SF-5000-AC	Boiler	350 GPM	5" Flange	13 1/2"	37 5/8"	308 lbs.
SF-6000-AC	Boiler	500 GPM	6" Flange	16"	40:	485 lbs.
SF-8000-AC	Boiler	700 GPM	8" Flange	19:	42"	703 lbs.
SF-10000-AC	Boiler	850 GPM	10" Flange	21"	52"	868 lbs.
SF-12000-AC	Boiler	1100 GPM	12" Flange	23 1/2"	54"	1190 lbs.

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SF-14000-AC	Boiler	1400 GPM	14" Flange	25:	56"	1478 lbs.
SF-16000-AC	Boiler	1800 GPM	16" Flange	27 1/2"	66"	1830 lbs.
SF-18000-AC	Boiler	2600 GPM	18" Flange	32"	66"	2600 lbs.
SF-20000-AC	Boiler	3100 GPM	20" Flange	34 1/4"	74"	2953 lbs.
SF-24000-AC	Boiler	4000 GPM	24" Flange	38 3/4"	74"	4050 lbs.
ACV-2-G	Cooling Tower	80 GPM	2" Victualic	5 3/4"	14 1/4"	24 lbs.
ACV-2.5-G	Cooling Tower	120 GPM	2 1/2" Victualic	6"	16 1/4"	29 lbs.
ACV-3-G	Cooling Tower	180 GPM	3" Victualic	7"	18"	44 lbs.
ACV-4-G	Cooling Tower	300 GPM	4" Victaulic	8 1/2"	22 1/8"	72 lbs.
ACV-5-AC	Cooling Tower	500 GPM	5" Flange	13 1/2"	37 5/8"	268 lbs.
ACV-6-AC	Cooling Tower	650 GPM	6" Flange	16"	40"	409 lbs.
ACV-8-AC	Cooling Tower	900 GPM	8" Flange	19:	42"	598 lbs.
ACV-10-AC	Cooling Tower	1200 GPM	10" Flange	21:"	52"	744 lbs.
ACV-12-AC	Cooling Tower	2000 GPM	12" Flange	23 1/2"	54"	1021 lbs.
ACV-14-AC	Cooling Tower	3000 GPM	14" Flange	25"	56"	1246 lbs.
ACV-16-AC	Cooling Tower	3800 GPM	16" Flange	27 1/2"	66"	1581 lbs.
ACV-18-AC	Cooling Tower	5000 GPM	18" Flange	32:	66"	2163 lbs.
ACV-20-AC	Cooling Tower	6400 GPM	20" Flange	34 1/4"	74"	2497 lbs.
ACV-24-AC	Cooling Tower	8000 GPM	24" Flange	38 3/4"	74"	3303 lbs.

We are seeking distributorships in states of Australia for this new technology and welcome your interest and further discussion.

Sincerely,

John Pulbrook
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