

# NIAGARA BLOWER SOLUTIONS

## What is WSAC®?

The Wet Surface Air Cooler is a closed-loop, evaporative cooling system.

Wet Surface Air Coolers are optimized for industrial applications where rugged design/fabrication and cost effective efficient closed-loop cooling/condensing are required.

### Applications:

Liquid Cooling  
Gas Cooling  
Vapor Condensing

### Industries:

Refining  
Power  
Wastewater  
Pulp & Paper  
Metals  
Mining  
Food/Beverage

## POOR QUALITY WATER USE IN WET SURFACE AIR COOLER APPLICATIONS

WSAC® systems provide solutions to poor quality water challenges in many applications and industries as shown in the case study examples below.

### STEEL COMPANY—St. Paul, MN

*Unit description:* Carbon Steel, galvanized outside only, tubes.

The current unit is nearly 10 years old and was a replacement for a Niagara unit that was in service for 21 years.

*Makeup water:* Well water with: alkalinity 308 mg/l, total hardness 290 mg/l, TDS 329 mg/l, conductivity 496 mohm/cm, pH 7.7

*Cycles of concentration:* This unit has no blowdown

*Water treatment:* The customer dumps a 55 gallon drum of citric de-acid into the basin of the unit 4 times a year and shovels the solids out once a year.

### AUTOMOTIVE COMPANY—Cleveland, OH

*Unit description:* 10 model A4409 units and 5 model A4415 units. Most units have Carbon Steel, galvanized outside only, tubes. New units were supplied with 304 Stainless Steel tubes. The oldest units have been in service for almost 20 years and the newest for 6 years. Units are used for induction furnace jacket cooling

*Makeup water:* Municipal source, typical hardness 220mg/l and TDS 280 mg/l

*Cycles of concentration:* 10-12 cycles

*Water treatment:* None. Aside from mild biological growth there are no signs of fouling.

### STEEL COMPANY—Hamilton, Ontario, Canada

*Unit description:* 304 Stainless Steel tubes. First unit has been in operation for over 22 years, the second for over 7 years. Units are used for primary and secondary coke plant scrubber liqueur cooling.

*Makeup water:* Cooling tower blowdown. Water is taken from Burlington Bay and treated with a mild biocide and dispersant and used as cooling tower makeup. It is taken out of the cooling tower after 4-6 cycles of concentration and taken directly into the WSAC.

*Cycles of concentration:* 4-6 more cycles in the WSAC, 8-12 overall.

*Water treatment:* None

### POWER PLANT—Kirkland Lake, Ontario, Canada

*Unit description:* Tubes are Carbon Steel galvanized on the outside only. Unit is used for vacuum steam condensing for power generation. Unit has been in continuous operation for over 15 years.

*Makeup water:* Municipal sewage plant effluent

*Cycles of concentration:* 7-10 cycles

*Water treatment:* Unknown

### COKE PLANT—Indianapolis, IN

*Unit description:* 304 Stainless Steel. Unit is used for primary liquor cooling (high fouling) and has been in continuous operation for over 17 years.

*Makeup water:* Municipal with total hardness of 320 mg/l.

*Cycles of concentration:* 3 cycles

*Water treatment:* For approximately 15 years this unit was pH monitored and treated with ortho phosphate.

### POWER PLANT—Lakeland, FL

*Unit description:* Four large field-erected concrete basin units that act as an auxiliary cooler. The system has been in continuous operation for over 10 years.

*Makeup water:* Cooling tower blowdown water

*Cycles of concentration:* 6.5-7 cycles

*Water treatment:* Corrosion inhibitor 11-635A is added (phosphate, bleach, acid)



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