

Big City Zoo's Green Effort Paying Off

PLASTIC COOLING TOWERS STILL RUNNING STRONG AFTER 14 YEARS AT ZOO'S POWER GENERATION STATION



The Wildlife Conservation Society saves wildlife and wild places worldwide. We do so through science, global conservation, education, and the management of the world's largest system of urban wildlife parks, led by the flagship Bronx Zoo. Together these activities change attitudes toward nature and help people imagine wildlife and humans living in harmony. WCS is committed to this mission because it is essential to the integrity of life on Earth.

Opposite Page: The Zoo Center, formerly known as the Elephant House, was built for the opening of the Bronx Zoo in 1899. The zoo, located within the Bronx Park, is the largest metropolitan zoo in the United States, comprising 265 acres of parklands and naturalistic habitats and home to more than 4,000 animals.

PHOTO BY JOHN CHU

Courtesy of the Bronx Zoo

In many ways, the Bronx Zoo stands in stark contrast to its home in the most famous metropolitan area in the world, New York City. Began in 1895 with the establishment of the New York Zoological Society (today its known as the Wildlife Conservation Society) it has always had the task of “wowing” city dwellers with an up close look at exotic animal life.

Now the zoo is taking steps to operate in the “Green” with improvements that promise cleaner operation while saving maintenance costs. One major step was taken years ago with purchase of new cooling towers.

Today, after more than 14 years, the cooling towers, which chill the intercooler for the natural gas engines at the power generation station, are still running strong and saving substantial costs on maintenance and manpower 12 months a year.

Installed when the zoo switched over to natural gas engines to avoid the corrosive and acidic vapors that resulted from the sulfur content in its earlier diesel-powered generators, the HDPE (high-density polyethylene) cooling towers became part of the zoo's first steps into a “green” program.

When the power station upgraded to natural gas engines, two advanced Delta cooling towers were also installed to draw heat off the intercooler water system. Four Superior natural gas engines ranging from 665 kW to 1,660 kW now provide energy to the 265-acre park – with much cleaner emissions.

One of the main elements of the latest environmental upgrading and restoration projects at the park is the integration of HDPE piping systems. Used for piping fresh and marine water to various sites, HDPE was specified because of its wide acceptance by the water industry for its maintenance-free operation.

Strong evidence of the leak-free and durability properties of HDPE can be seen in the long life of the power station's cooling towers. Similar metal-clad designs often require frequent re-cladding and re-painting of galvanized shells as well as other labor-intensive maintenance such as cleaning and replenishment of water treatment chemicals.

“By eliminating the corrosion effects on our cooling towers we are virtually eliminating the need for repetitive routine service,” says Mike Henry, Manager of Technical Services at the power generation station. “That means saving money on maintenance costs for relining and other repairs, plus labor. So, there is much less downtime involved, including repairs and cleaning. We don't need to upkeep the painting and also have lower chemical costs.

Virtually impervious to corrosion, the plastic cooling tower was developed by Delta Cooling Towers (Rockaway, NJ) in the early 1970s. They are becoming increasingly popular throughout industries where coolant temperature ranges are critical to processes.

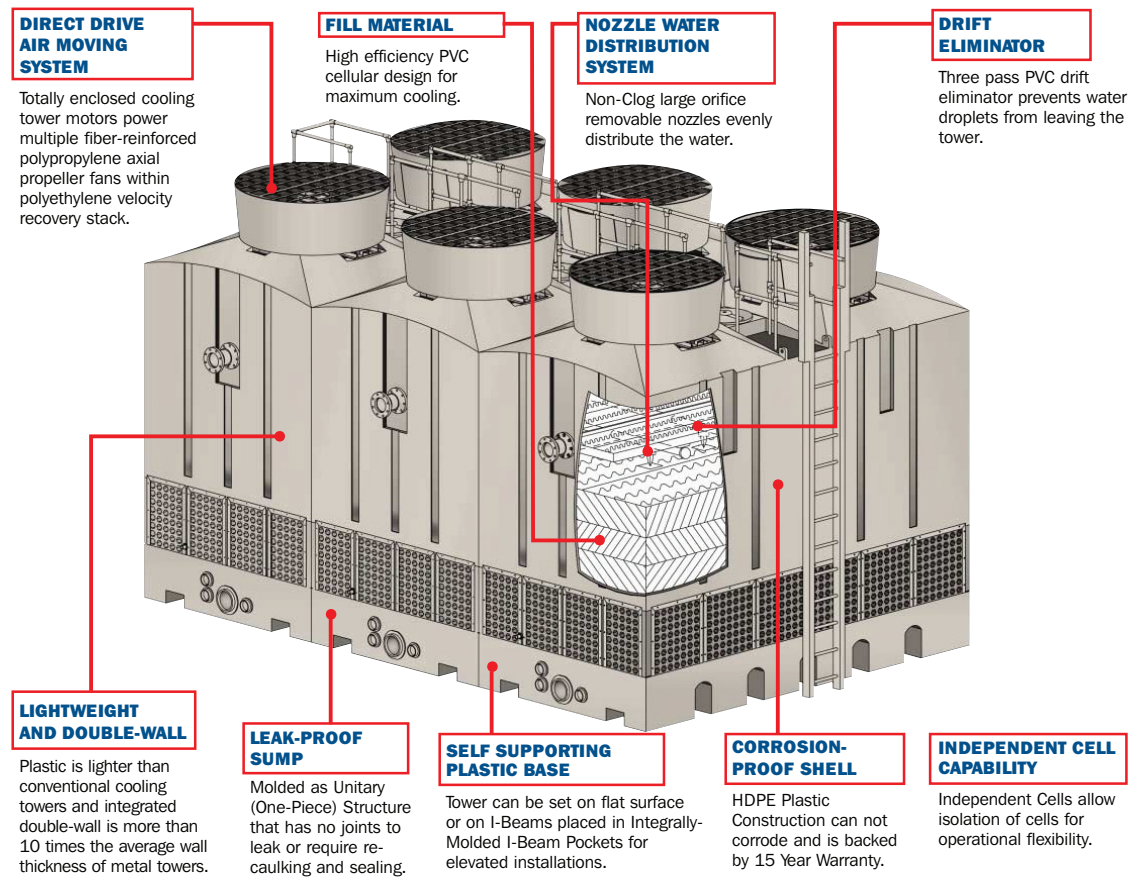
The nemesis of conventional metal-clad cooling towers is pH, either high or low. A high pH leads to excessive calcium and other ceramic-like deposits. When the pH of a liquid coolant becomes acidic (low), either because



Delta's TM Series® cooling towers are induced draft counter flow design cooling towers with single module capacities from 250 to 2,000 cooling tons. These towers are a modular design that Delta has been manufacturing since 2001 and have been very well received in both commercial and industrial applications.

Principles of Cooling Towers:
All cooling towers operate on the principle of removing heat from water by evaporating a small portion of the water that is recirculated through the unit. The heat that is removed is called the latent heat of vaporization. Each one pound of water that is evaporated removes approximately 1,000 BTU's in the form of latent heat.

IMAGE AND INFO COURTESY OF DELTA COOLING TOWERS, INC.



of external (e.g. atmospheric) elements or infiltration of process elements (e.g. material fines), the veneer of zinc galvanizing used on most metal towers immediately begins to deteriorate.

A pH lower than 4 will destroy this protective lining in a matter of months. At that point contractors are required to replace the zinc galvanizing with expensive coatings and repair any cavities and other damage that may have occurred. If the repair process is extensive, costly process interruptions may be required.

Many manufacturers with metal cooling towers use solvents to prevent scale from occurring in their process fluids. Such chemicals sometimes leak into the cooling system and they corrode the cooling towers. Solvents may also attack the metal at the cladding seams, or simply wear down the galvanizing. Either way, once the zinc plating of a metal tower is undermined, the problem escalates, resulting in expensive repairs or even replacement.

Composed of material that is literally impervious to the harsh pH environments that devastate metal cooling towers, engineered

plastic cooling towers are energy efficient, available in a wide array of capacities and air flows, and will operate with both process and energy efficiency for many years.

Because the engineered plastic cooling towers are impervious to the harsh environmental elements and cleaning agents that cause so many metal towers to fail early, they carry a much longer factory warranty, most up to 15 years.

In the past, plastic cooling towers were too small for many industrial processes. Until recently, galvanized metal cooling towers were a "given" for most applications above 250 tons. Processors requiring high-capacity cooling were forced to build custom-designed towers on site, often at a high cost in labor and materials.

Today that situation has changed dramatically. Delta, for example, has introduced its TM Series® of factory-assembled plastic towers to suit almost any size requirements up to 2,000 cooling tons in a single, modularized unit.

For the Bronx Zoo, this is just a beginning in what will be an even "Greener" future. 🌱



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