

Galvanized or Plastic?

Modular plastic cooling towers facilitate increased manufacturing capacity

By Ed Sullivan

Cooling towers, which reduce the heat of circulating water used to cool industrial processes and HVAC systems throughout the world, have undergone substantial design changes over the years. This is particularly noticeable with the introduction of high-density polyethylene (HDPE) cooling towers, which can provide long service life with reduced maintenance requirements.

While these attributes are compelling, the idea of incorporating this technology to increase production capacity is, for many, an unexpected benefit of the HDPE cooling tower technology.

An example of this capacity benefit occurred when Tencarva Machinery was asked by Strand-Tech Martin, a manufacturer of prestressed concrete strand and high-carbon wire, to evaluate a galvanized cooling tower that had required extensive service over its lifespan.

Tencarva Machinery is a distributor of liquid process equipment and custom-engineered systems, most of which incorporate pumping packages and electrical controls. The company serves industrial and municipal markets in the Southeast.

"Our inspection made it clear that the existing cooling tower, a typical galvanized model, was beyond practical repair," said Chad Plott of Tencarva. Plott explained the main problem was a destructive, corrosive effect on the metal-clad shell produced by salt air that permeates coastal areas such as Charleston, S.C., where Strand-Tech Martin's manufacturing plant is located.



HDPE engineered plastic cooling towers are designed to solve corrosion problems, which have plagued metal towers due to problems such as soft water, aggressive water treatment, and ambient factors such as salt air or caustic industrial gases.

The process used to produce the prestressed concrete strand and high-carbon wire products requires a cooling tower for the wire-drawing machines, which run at high temperatures.

"They were barely getting enough cooling from the old tower, and really wanted a cooling tower that would allow them to expand the number of machines they run," Plott said.

The Strand-Tech application is an open cooling system, Plott explained. It includes pumps that feed water to the wire-drawing machines from the cooling tower. The cooling water goes through heat exchangers on the wire-drawing machines, provides spray cooling on the machine, and travels through coolant passages in the wire-drawing dies. Eventually, the water gravity-feeds from that production equipment back to the cooling tower.

When Plott was asked to make a recommendation for a replacement cooling tower, he suggested an HDPE tower manufactured by Delta Cooling Towers. HDPE engineered plastic cooling towers are designed to solve corrosion problems, which have plagued metal towers due to problems such as soft water, aggressive water treatment, and

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Tencarva selected the TM Series, a modular cooling tower system that allows isolation of up to eight cooling cells for maximum operational flexibility. Plott recommended a four-cell configuration, which can produce up to 1,580 cooling tons.

Boosting Capacity

Plott explained that one of the primary reasons for the customer's inquiry into a new type of cooling tower was that in addition to having sustained structural damage, the old tower's efficiency had fallen off. As a result, cooling capacity was only marginally sufficient for

production, and the company was looking to significantly increase production capacity.

Plott said that since the new HDPE tower system was installed in late 2014, it has provided an additional 30% cooling capacity, more than enough for the added production output the customer required, and will likely

meet additional production increases in the foreseeable future.

If more cooling capability had been needed, the modular design of the TM Series easily could have allowed doubling the capacity of the four-cell cooling tower via the installation of an eight-cell version.

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Supplemental Benefits

In addition to solving the corrosion and cooling capacity problems, Plott said the new cooling tower technology has provided other benefits to his customer.

Among those is the 20-year standard warranty on the double-walled HDPE shell. In

addition, the tower fans now come with direct-drive motors, which relieve the maintenance and downtime issues commonly associated with belt-driven or gear-reducer systems.

Another advantage is the cooling tower's efficiency, including the fan drive system.

It is composed of direct-drive fans staged with two fans per cell.

"This staged design means it's not always necessary to run all of the fans continuously," Plott said. "The payoff is a substantial savings on electric power consumption."

The ease of installation of the four-module cooling tower was an unexpected benefit. Because Delta products are pre-assembled at



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The new HDPE tower system provides 30% more cooling capacity, and can meet additional production increases in the future.

the factory, installation normally goes quickly and easily.

"As far as installation was concerned, nothing unexpected occurred," Plott said. "Tencarva supplied the pumps and cooling tower, and the customer provided a contractor who performed the installation. Even with the modular design, installation was fairly easy to complete. The installers were able to use the existing footprint as well as use the same water storage area underneath the cooling tower mounting pad."

Maintenance is another positive. The corrosion problem of the salt air will become obviated, and the direct-drive fan system will require minimal service.

In the end, the new solution aims to provide added production capacity with no maintenance issues or downtime surprises. **WQP**

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