

A 1-2 Punch for Compact Cooling

Compact heat exchanger & cooling tower combination removes heat & stabilizes temperatures

By John Flaherty

When you picture the cooling systems used in process industries, the first image that probably comes to mind is a cluster of massive cooling towers perched atop a refinery or chemical plant. But for Carl Pendola, P.E., of Penco Equipment Inc. in Pearland, Texas, there is also a range of applications in the process industries that require more compact cooling systems.

“There are many large processing plants that have remote satellite facilities, pilot plants or research operations that require smaller, independent cooling packages that could be well-served by a combination of a compact, factory-assembled cooling tower plus a small-footprint, economical heat exchanger,” Pendola said.

A 35-year veteran in servicing the chemical, gas and oil processing industries, Pendola has been involved with equipment design and selection for many applications, with specialties in heat transfer and mixing.

A recent example of one of Pendola’s projects is a custom, compact cooling system. The application was a mud tank designed by NRG Mfg. of Tomball, Texas, for R&D of down-hole drilling tools manufactured by a major oil services company. NRG is a manufacturer of custom pressure vessels, mud tanks and well stimulation solutions, also known as frack equipment.

Most NRG mud systems are mobile, designed to mechanically remove destructive solids and sediment from drilling mud, resulting in fluid retention, reduced wear on equipment, more efficient mud agitation, efficient cleanout maintenance and a safer work environment. This newly designed mud system for testing down-hole tools, however, will accommodate a particularly abrasive mud and run it through the tools for erosion testing and other wear factors.

“Because some drilling fluids are very abrasive, heat can build quickly, and controlling mud temperature becomes an issue,” said Chris Post, NRG director of engineering and projects for pressure vessels and drilling systems. “So our customer asked us to incorporate a cooling system that would reduce and control the heat levels.”



The plate and frame heat exchangers seen here are an ideal fit for smaller plastic cooling tower models, which complement the compact footprint that is important to many industrial process applications.

Designing an Effective System

The system Post’s team designed was composed of a plate-type heat exchanger manufactured by Tranter of Wichita Falls, Texas, plus a compact 265-ton cooling tower from Delta Cooling Towers.

As far as the specifications of the cooling system are concerned, Post said he was sure that a Tranter plate-type heat exchanger would do the job without taking up much space. He relied on Pendola’s firm, a Tranter sales agent, to specify the cooling tower.

According to Pendola, a Delta tower was an ideal solution for a number of reasons, including available sizes, an economical price and engineered high-density polyethylene (HDPE) construction. He pointed out that the dependable performance and minimal maintenance requirements have enabled this line of seamless, factory-assembled cooling towers to gain favor in the industry.

“The engineered plastic is relatively impervious to corrosion



The compact, modular cooling towers pictured here save on energy and can give smaller industrial applications the opportunity to use a relatively small cooling tower when their needs are for relatively limited cooling capacity, then add cooling tower modules to the platform in order to boost cooling capacity as their needs grow.

from the environment, including ozone and the airborne contaminants that may be expelled from plants anywhere near the cooling tower installation,” Pendola said. “In the Houston area we have a fairly damp climate, and that can lead to corrosion that will damage a galvanized cooling tower. Many users want to get away from that problem, and so they go with an HDPE cooling tower, which is so dependable that the shell carries a 20-year warranty.”

Post added that ease of installation of a factory-assembled cooling tower is another plus. “The crew [members] that I had install the cooling tower were not experienced cooling tower hands, but they were able to get the tower assembled rather easily,” he said. “I think this is another factor that bodes well for this model of cooling tower.”

Integrating advanced resins and molding techniques, engineered-plastic cooling towers now are available in larger sizes and modular configurations that make them well-suited for even higher-capacity applications (1,500 to 5,000 cooling tons) that traditionally depended on field-constructed installations.

“These Tranter plate and frame heat exchangers are a natural fit for smaller plastic cooling tower models, which complement the compact footprint that is important to many applications,” Pendola said. “The 265-ton TM Series cooling tower is also extremely energy efficient, using only six-fan horsepower to produce the 265 cooling tons.”

He added that the compact, modular cooling towers save on energy and can give smaller industrial applications the opportunity to use a relatively small cooling tower when their needs are for relatively limited cooling capacity, then add cooling tower modules to the platform in order to boost cooling capacity as their needs grow. **IWWD**

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