

CENTRAL FLORIDA RESEARCH PARK

Submersible Mixers Blend Bulk Hypochlorite Inside Underground Concrete Water Storage Tank

OVERVIEW

The Central Florida Research Park (CFRP) is a large campus-like environment dedicated to providing space for high tech companies, Defense Department contractors and the adjacent University of Central Florida. CFRP was established through the Orange County Research and Development Authority to support the development of businesses commercialization of technologies spawned by Central Florida's growing technological industrial and commercial businesses. The property spans over 1,000 acres with 58 buildings housing 125 companies.

CFRP manages its own independent water treatment and distribution system with a single operator and is subject to the same state and federal laws regarding drinking water quality as other municipal water agencies. Water is pumped from two wells in the development to a one-million gallon (MG) aboveground concrete storage tank where liquid bulk hypochlorite is automatically injected through a pipe near the top of the tank.

Recognizing that 12.5% sodium hypochlorite is denser than water, CFRP became concerned about thermal and chemical stratification within the tank due to the Florida heat. Their concern was validated by online chlorine analyzer data showing chlorine levels fluctuating as the tank went through its fill and drain cycle. Tanks without powerful active mixers are prone to short circuiting areas where water stratifies, as well as "hot spots" where disinfectant does not blend and remains concentrated. These conditions can adversely affect the homogeneity of the water age and disinfectant residual throughout the tank and in the distribution system.

The operator responsible for the system began researching tank mixers in order to better blend the water in the tank. His research led him to PAX Water Technologies in Richmond, California. With nearly 3,000 mixers installed worldwide, PAX Water has a reputation for providing high quality products backed by rigorous science and engineering. A phone call with a local representative identified a PAX PWM400 Mixer as the right size mixer for the process objective – mixing water and hypochlorite inside a 1 MG underground concrete storage tank.



Given the small operations staff at CFRP, it was important to invest in a quality piece of equipment with a strong performance specification. The PAX PWM400 is designed to produce temperature uniformity in storage tanks from top to bottom within 0.5°C (0.9°F), as well as disinfectant residual uniformity within 0.2 ppm, within 24 hours following installation and activation in tanks up to 4 MG. The submersible mixer stands roughly three feet high, with a tripod base. The 0.5 horsepower motor, together with the proprietary Lily impeller, create a powerful, patented mixing pattern inside the tank within a matter of hours. The submersible mixer is designed to operate 24/7 to keep the entire volume of water inside the tank constantly in motion.

The ability to install the mixing system without hiring additional contractors was also important to CFRP staff. They wanted to be able to quickly install and retrieve the equipment, in case of needed tank maintenance. The PWM400 submersible mixer features collapsible legs to get through hatches as small as 12 inches in diameter and is available with a long-bail handle and chain for easy self-installation.

Staff at CFRP were eager to get a mixer installed into their tank quickly in order to address the variations in disinfectant residual. Within one week of their initial phone call to PAX Water Technologies, a mixer arrived at CFRP ready-to-install. The staff installed the mixer into the tank through a roof hatch. Over a short period of time, disinfectant levels on the chlorine analyzers began to level out throughout the tank. Areas with high readings were decreased and spots with low readings were increased. The staff could see that the full volume of the tank was being mixed as readings remained consistent over time, including shortly after hypochlorite was added to the tank. The mixer achieved the process objective by eliminating dead zones and hot spots and keeping disinfectant levels consistent throughout the tank and into the distribution system.



"That mixer is one of the most important pieces of equipment at this plant."

Tom King, Operations Manager, Central Florida Research Park

To access our full assortment of case studies, data sheets, brochures and more, visit our document library at <https://documents.cleanwater1.com> or scan the QR code.

