

Aquatic Center's Kelley HVLS Fans Work With HVAC to Improve Air Quality and Comfort



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Organization:

Carroll Independent School District (ISD) Aquatics Center

Challenge:

Improve the aquatic center's air quality environment and comfort level for all patrons without causing any negative impact on student athletes.

Solution:

Integration of two Kelley® WAVE™ HVLS fans with HVAC system that consistently and slowly moves a high volume of air throughout the aquatic center and at the surface of the pool water where there is the highest concentration of disinfection by-products.

Results:

Energy-efficient approach to improving both air quality and the comfort of patrons.

Environment:

Aquatic Fitness and Recreation

Geography:

Southlake, TX



Improving both water and air quality in aquatic facilities has been an ongoing issue of concern across the U.S. in recent decades. In fact, the U.S. Department of Health and Human Services' Centers for Disease Control and Prevention in August 2014 released the first edition of its Model Aquatic Health Code (MAHC). The MAHC is an extensive set of voluntary guidelines based on science and best practices that were developed to help programs that regulate public aquatic facilities, including various performance requirements for air handling systems.

Likewise, USA Swimming (the 400,000-member national governing body for the sport of swimming in the U.S.) recommends that a comprehensive air and water quality improvement program include ensuring that an aquatic center's air circulation system include more fresh air introduction as well as better turnover or more efficient closed system circulation and dehumidification to avoid what the organization defines as "bad air".

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– Bill Christensen, Aquatics Manager, Carroll ISD Aquatics Center

Chloramines contribute to “bad air”

According to USA Swimming, the “bad air” problem seems to stem from chloramines in the water and not chlorine. Chloramine is a chlorine compound that cannot burn off in the water. Chloramines are released during evaporation and when water is agitated. Chloramines smell like ammonia and various health studies have linked them to causing serious respiratory problems—including asthma—for swimmers, staff around the pool and spectators in the stands.

In an effort to improve its own air quality and comfort levels for its patrons, the Carroll Independent School District (ISD) Aquatics Center located in Southlake, TX installed two Kelley® WAVE™ HVLS fans. The 24-foot diameter fans were properly spaced apart each at approximately 30 feet above the water surface to provide even air flow coverage for both the Aquatics Center’s main and warm-up pool areas.



“Because the fans are constantly running, they’ve made a positive impact on the amount of fresh air that needs to be brought in through our standard HVAC system, so both technologies integrate well.”

– Bill Christensen, Aquatics Manager, Carroll ISD Aquatics Center

Situated on the Carroll Senior High School campus and in operation since 2002, the 40,000 square-foot Aquatics Center hosts a state-of-the-art 186-foot by 75-foot pool with transitory bulkheads allowing for various competition courses.

By installing Kelley HVLS fans, the Aquatics Center has improved on meeting two critical MAHC recommendations that fall under Section 4.0 Facility Design Standards & Construction:

- **Consistent Air Flow** - an indoor aquatic facility air handling system shall be designed to provide consistent air flow through all parts of the facility to preclude any stagnant areas.
- **Airflow Across Water Surface** - the air handling system shall be designed considering airflow across the water surface to promote removal of disinfection by-products (i.e. chloramines).

Slow fan speed critical to swimmers’ comfort level

Dan Linder, Sales Manager, Kelley HVLS Fans, Entrematic helped engineer an optimally-sized HVLS fan application for the Aquatics Center that would move the largest amount of air at a slow enough speed to avoid causing the swimmers any discomfort. The end result is constant air movement that will not cause any negative impact on the swimmers, especially for those competing in meets and diving competitions.

The Aquatic Center also uses two Kelley adjustable fan speed control station panels (one for each fan) in NEMA 4X water-proof enclosures. The fan control stations feature touchscreen LCD panels with forward/off/reverse selections, self-diagnostics as well as 4-digit pass code protection.

“The fans not only use a low amount of energy, they’ve made a big impact on the amount of air being moved around our pools’ surfaces,” commented Bill Christensen, Aquatics Manager, Carroll ISD Aquatics Center. “Because the fans are constantly running, they’ve made a positive impact on the amount of fresh air that needs brought in through our HVAC system, so both technologies integrate well.”

Christensen noted that among the favorable comments received from staff, students and other patrons alike is that when they visit or compete at other aquatic facilities, and then return to the Carroll ISD Aquatics Center, the difference in air quality is highly noticeable. Likewise, visiting swim teams have voiced appreciation for the improved air quality. Swimmers have even commented that because the air directly above the water surface feels cleaner, they take deeper breaths than before the fans were installed, which ultimately affects their competitive performance.

“Kids and parents as well love the fans and think they’re great because the fans have helped to eliminate the stagnancy of the air in the Center,” said Christensen. “There are very few aquatic centers throughout the U.S. that operate the types of fans that we do, however, they are becoming increasingly popular.”

Christensen added, “One of the key reasons we decided to install our own fans is because the University of Texas at Austin and Oklahoma City Community College operate fans in their aquatic centers and have had great success with them. We’re experiencing that same level of satisfaction as well.”

