

PRODUCT APPLICATION GUIDE | POOLS



POOL SOURCE CAPTURE

Maintaining a healthy pool environment is critical for swimmers and spectators alike. Well-designed air distribution systems help by removing unhealthy off-gassed disinfection by-products (DBPs) created from pool water treatment chemicals. One option is to incorporate the concept of source capture into the air distribution system.

WHAT IS POOL SOURCE CAPTURE

A pool source capture system induces low velocity airflow, typically 20-30 feet per minute, across a pool surface to "capture" a portion of the DBPs (such as trichloramine) just above the surface of the water as they migrate into the air. The system then pulls the DBPs to low exhaust points positioned near the pool surface where they can be removed from the space. It requires its own duct system separate from the main return ducts used to promote good mixing of the air within the pool space.

HOW DOES IT WORK

As the low velocity air moves across the pool surface, the captured DBPs are directed towards dedicated exhaust points. While that air may be discarded directly outside if allowed by code, it is far more cost effective if it is ducted to the pool air handling unit. That unit is equipped with energy recovery, capturing energy from the the warm/humid exhaust airstream before it is routed out of the building. This method allows the heat and humidity to be captured and safely used to pre-treat the outside air. To reduce the risk of cross contamination, an independent, filtered airflow path should be designed within the pool air handling unit such that the source capture exhaust air cannot mix with the main return/exhaust air.

HOW IS IT IMPLEMENTED

Source capture systems can be designed by either a vendor that specializes in these systems or by a consulting engineer.

VENDOR SUPPLIED SYSTEMS

- In new pool construction, the exhaust intakes to the source capture system are usually built into the pool gutter itself, just above the water surface along one or both of the long sides of the pool.
- In retrofit applications, special benches can be installed with source capture exhaust intakes built into them.

CONSULTING ENGINEER DESIGNED SYSTEMS

• Low exhaust intakes are typically provided a few feet above the deck along one of the long sides of the pool.

In all cases, the source capture exhaust air is typically ducted to the pool dehumidifier for exhaust air energy recovery (often mandated by Energy Code) before being routed out of the building.

WHY IS IT USED

Trichloramine, the most common DBP, is heavier than air and tends to settle over the pool surface when not removed. Inhalation of these chemicals has been shown to adversely affect lung function so providing proper ventilation to a pool space is critical.

Historically, guidance for air distribution recommended no air movement immediately over the pool surface due to fears that it would increase evaporation, lead to higher operating costs, and make swimmers uncomfortable. The combination of these factors along with often inadequate fresh air led to poor indoor air quality (IAQ) in many pool facilities. ASHRAE now recommends air movement over the pool surface to help prevent this problem.

Using a source capture system does not guarantee a healthy pool space. It is one option for the recommended low return/exhaust in the air distribution system. Adequate fresh air must be provided and effectively distributed throughout a space. Due to the large variation in pool enclosures (such as varying height, windows, skylights, and seating), and the type of pool (lap, leisure, competition, therapy, swim school, etc.), the amount of supply air and fresh air required to be delivered to the pool deck and other areas varies significantly. The key to a healthy space is to provide a well-designed air distribution system with both low and high return/exhaust points designed with the proper amount of fresh air.

WHERE IS IT USED

Source capture systems can be applied to any indoor pool either when the pool is newly constructed or as a retrofit solution. They are best suited for larger pools, due to first cost, and pools with limited swimmer activity such as lap pools and therapy pools. Pools with a lot of swimmer activity create more turbulence sending the DBPs further above the water's surface and making the low exhaust points of a source capture system less effective.





Pool source capture systems pull harmful DBPs into exhaust intakes at the edge of the pool. The pool source capture airstream is never mixed with the main return airstream.



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