

Eleven Common Mistakes

Most Common Mistakes When Building an Indoor Swimming Pool



1 Installing an inadequate air delivery system (ductwork)

We equate ductwork in a pool room to the “arteries” with the dehumidification system being the “heart” of the system. Good heart, bad arteries will always result in an unhealthy building with a poor life expectancy. In our decades of consulting, a good majority of all ductwork for indoor swimming pools is inadequate, ill designed, undersized, and misapplied. This has become DXair's number one priority for all of our clients. We provide ductwork design for every pool room dehumidification system sold.

2 Not using mechanical dehumidification to control the environment

Thinking that *waste ventilation* (exhaust fans and make up air) is going to control this environment is the biggest misconception in this industry. You cannot properly maintain 50-60% relative humidity (RH) with exhaust fans/ventilation systems due to the varying outdoor temperatures and humidity. In addition, waste systems cost 80% more to operate in the winter, do not offer heat recovery for pool and space heating, and have no cooling capabilities in the summer. For more on this subject, see our *Waste Ventilation* bulletin.

3 Not sizing pool dehumidification properly (over sizing and under sizing)

Sizing a system has two major components to consider. First, is the compressor section to meet the evaporation rate based on pool and spa size and temperatures of water and air. Second, and most often ignored, is the air turnover rate, i.e. air handling component based on the cubic feet of space. Many companies size for evaporation but neglect to consider the VOLUME of the room, or size based on a pool cover and undersize systems to handle the loads. Inadequate air movement and poorly designed duct and inadequate air turnovers rates lead to higher humidity within the envelope. This is disastrous due to humid air stratification causing rapid deterioration of the upper structure components.

4 Using the heated swimming pool to heat the room

Another common myth is the idea heat from the pool will heat the room. There is nothing that is further from the truth. Rather than explain the physics of why it is false, we suggest you request to visit an installation in the winter months from someone who makes these claims. Using a pool to heat the space severely increases humidity and condensation within the space. Keeping pool water warmer than air temperature leads to double evaporation and larger equipment to cover the additional loads. Always maintain the proper pool/air temperature ratios.



5 Wasting construction dollars on the pool enclosure

Many design build companies and architects recommend using expensive building materials to negate the effects of high humidity. This is a totally unnecessary if a properly designed environmental control system is installed and proper pool chemistry is maintained. An enclosure can be built using standard/conventional building materials with the same life as any other type building. The only difference is a VAPOR BARRIER is required along with NEGATIVE PRESSURE.

6 Pool dehumidifiers using “UN-CLEANABLE” 8-row evaporator coils

The evaporator coil on any dehumidifier is the component that takes the moisture out of the air. Early manufacturers designed equipment with 8 row coils and still use them today. There are two important facts about 8 row coils:

- a) They do not remove more moisture than a 4 row coil
- b) 8 row coils are impossible to clean

You should buy only products that use 3, 4 or 5 row evaporator coils. We cover this in more detail in our *Coil Myths* bulletin



All DXair systems are built with 3 and 4 row field cleanable evaporator coils

7 Not getting a written assurance on pool dehumidifier operation and performance

This is a must for any customer spending tens of thousands of dollars to protect their investment. A design build contractor and/or any engineering group should be willing to stand behind their work. Historically a large percentage of indoor pool enclosures are a disaster with no accountability. DXair exceeds ASHRAE building design guidelines, ACCA, and SPS manuals relating to the duct work delivery systems, and all equipment is sized to maintain recommended room temperatures and humidity levels.

8 Inadequate mechanical space

This has been a problem in this industry for a long time. Pool dehumidifiers crammed into closets, crawl spaces, and attic spaces cause problems for the mechanical firm in the installation process, and further down the road make service and preventive maintenance difficult. The proper duct transitions and room for serviceability must be appropriated for a healthy system. DXair will design

to provide all clients with the mechanical space required for the project. In general, 4-12 ton systems will require 12x6 feet of mechanical space and for the proper 30-36" clearances to access panels. Attic spaces, crawl spaces, closets, garages, installing equipment in the pool room without protection, and areas with only trap door access are NOT appropriate mechanical spaces for dehumidification systems.

9 Inadequate air movement in skylight soffits

Skylights are windows and must have warm dry air *washing* them to prevent moisture buildup and subsequent dripping. Many skylights are enclosed in a SOFFIT which traps hot, humid air. These soffits must be properly ventilated, which if not, will cause dripping in the natatorium and severe damage due to constant moisture saturating the window frame. It also causes moisture to condense and find its way into the roof structure causing long term structural damage. If ductwork cannot reach the skylights, strategically placed ceiling fans blowing upward must be installed. Remember, air flow is CRITICAL and the #1 factor to be addressed in all pool room structures.

10 Unconditioned space above drop ceilings

Humidity is nature's water pump. A suspended/drop ceiling in any indoor swimming pool area is asking for trouble. Moisture can migrate into the dead air space above the ceiling and proceed to deteriorate the structure area above. It can also migrate to other areas of the building. Therefore, any potential dead air spaces must be considered part of the overall environment, and must be conditioned to remove the humidity and avoid potential building damage. Even "egg crating" and ventilating the drop ceiling does not, and cannot, guarantee that no moisture will not be found in the drop ceiling areas.



11 "It's just another room to heat and cool"

Many times pool room dehumidification systems are an "afterthought." Expensive structures are completed without consideration or budgeting for controlling humidity—proper ductwork systems, vapor barrier, negative pressure, and mechanical space to name a few of the variables. The cost of preventing problems in the design stage is considerably less than the repair costs down the road.

This is just a short list of the many costly pitfalls that await the uninformed. For additional information call 800-514-7051 or email Chris Leonetti: chris@dxair.com.