

An Economical Way To Control Indoor Pool Humidity

Twenty years ago, the only environmental control system for an indoor pool was to heat outside air, bring it over the pool water, and exhaust this air back outside. That is expensive and sometimes ineffective, way of controlling humidity. Thanks to current technology, there is a cost-effective way to have a perfect natatorium environment:

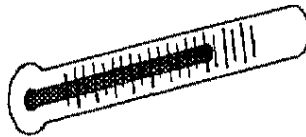
DEHUMIDIFICATION

A mechanical environmental control system. In general, because of the extremely high relative humidity in an indoor pool area without dehumidification, the growth of *mold*, *mildew*, and fungus is imminent. There is a higher than normal level of potentially dangerous bacterial growth within the building. The only way to eliminate these problems is to bring in, heat, and reject a sufficient amount of outside air to keep rh within the pool space between 50% and 60%. This process can only work when the outside air is cool and dry enough to allow for humidity control. In the winter, an indoor pool without a dehumidification system will normally be *cool* and *clammy*, because the air temperature in the space will not be heated warm enough to be comfortable. Normally the outside air is cool and dry enough to use this process; but if the air is too cool (say 10 degree F), an enormous amount of energy is required to heat the air up to design space temperature.

LET YOUR POOL BREATHE

A typical pool operator will reduce the amount of outside air introduced into the building, hoping to save energy and lower operating costs, resulting in a pool that is unhealthy and uncomfortable for both the swimmer and the spectator.

In the fall, when the outside air temperature is mild, you have a chance of controlling the humidity without an enormous amount of energy, with an outside air system. In spring and summer, when outside temperatures increase and relative humidity increases because of rain, you bring into the pool space that same humid outside air. Example: If the



outside air temperature is 75 degrees and it is raining, you bring in this 75 degree air with 100% rh, making it impossible to control humidity. With an outside air system, there will be no cooling of the space. With 95 degree outside air, you are going to bring 95 degree air into the natatorium. If it is raining, you will bring in 100% rh. You will lose both temperature and humidity control within the space. In the spring, you would want to be able to open doors and windows. But, when the temperature outside drops, someone would need to close the windows and doors and turn the outside air system back on to maintain temperature and rh. What normally ends up happening in spring, is that the pool owner decides to leave the doors and windows open. The space temperature drops in the evening, increasing evaporation from the water and resulting in higher operating costs.

At this point the windows are shut, and the fans turned on to control humidity. But, to save energy, the humidity is allowed to increase to 80% or 90%. This results in an uncomfortable and unhealthy environment for the spectator and pool user, not to mention structural damage that results on all types of buildings at such humidity, coupled with the effects of the chlorine

environment. It is possible to install automatic controls to bring in outside air but this increases installation cost. If the controls get more sophisticated, they can sense the rh and outside temperature, but are more expensive. Plus, the controls for rh and outside air temperature have not been proven reliable, requiring frequent maintenance and monitoring.

ALL 4 SEASONS HAVE INHERENT PROBLEMS

Conditions of all four seasons contribute to building structural problems. The building is normally the most expensive portion of the natatorium. Careful analysis of a total life-cycle cost basis reveals the cost to replace the building or roof at 10 to 15 years, when an improper system to control humidity is used. With a properly designed and installed dehumidification system, year-round conditions of the natatorium will be the decision



of the pool owner. Air temperature within the space can be held at a desired temperature (+ or - 2 degrees for variance in controls). The building can be constructed with conventional building materials, saving on construction cost. The space can be decorated in any decor, at the owners discretion. Some indoor pool owners have chosen wallpaper and carpeting. You can use wooden-frame windows. Even leather upholstered furniture, large-screen TVs, billiard tables, and oil paintings have been used pool-side.