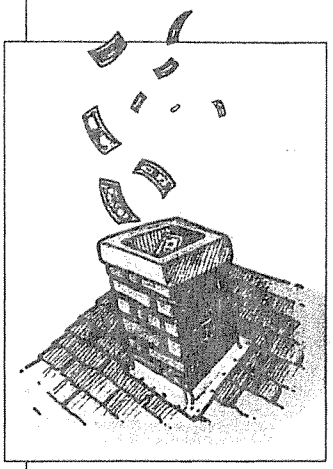

POOL/SPA HUMIDITY CONTROL

by Joseph E. Kielec

Correctly managing indoor pool and spa humidity not only protects the structure they're in, it can guard the health of the people using the facilities.

Heating water for an indoor swimming pool or spa has about the same effect as putting a pot of water on the kitchen stove. As the water temperature increases, so does the evaporation rate and the relative humidity of the surrounding air.

As this moisture laden air encounters cool surfaces such as windows, ceilings, or outdoor walls it also cools, losing its ability to hold moisture, and water condenses onto the surfaces.

This process continues as long as the water is heated. In a typical indoor residential swimming pool, it can result in as much as 100 gal. of water being given up by the pool every day of the year.

These gallons of moisture can permeate an indoor pool enclosure creating problems wherever it cools to the dew point and condenses. Areas where the moisture carried in the air condenses on cooler surfaces may become havens for fungus, mold, and mildew which can give off potentially dangerous biotoxins.

This moisture-laden, hot, humid air is uncomfortable for everyone in the area except the swimmers, and it limits the area for other recreational activities.

Gaps in moisture barriers can give this water vapor access to low temperature building structural members, where hidden condensation deposits accumulate unseen for years. Add unavoidable decay accelerated by mold and fungus to the fact that wet wood has a fraction of dry wood's strength, and long term building problems and premature structural and equipment failures are inevitable.

Evaporation also transfers energy from the pool or spa to the surrounding air then to the condensing surfaces or exhaust air. This energy loss from a typical indoor pool can be in the range of 40,000 BTU/hr., which is what you might expect from an entire moderately sized (2,000 sq.ft.) home.

One traditional approach to dealing with all this humid air is to simply open all the doors and windows in the pool area and let Nature dehumidify with drier outdoor air. This passive approach might work on days when the outdoor air is at the same temperature as that desired in the pool area and with a lower relative humidity.

Active dehumidification systems control damaging and health threatening humidity in indoor pool and spa enclosures. Registers at the base of each window provide warm, dry air from the dehumidifier to wash over these condensation surfaces.

These conditions rarely exist, however. So you get the same nasty results as listed above, with the added unpleasantness of high pool heating costs, because the pool heat energy is literally being "thrown out the window."

A second, and slightly more sophisticated, dehumidification method is to build a ventilation system where exhaust fans remove the humid air and make-up air units bring in fresh air and either heat or cool it to the desired temperature.

This "conditioned" air is then circulated around the pool area in