



WHY AIRXCHANGE WHEELS DO NOT SUPPORT FUNGAL GROWTH

There is evidence that fungi germinate when water condenses onto surfaces of air handling systems where nutrients are present. Surfaces which remain wet for a period of 12 to 24 hours allow fungi and mold spores already present to “bloom”, resulting in a potential IAQ problem. This knowledge has led to questions of whether desiccant energy recovery ventilation wheels, which in fact transfer water from one airstream to another, could provide a medium for growth of mold and fungi. Such is not the case for Airxchange technology, nor has it been reported in the literature for other enthalpy wheels.

In silica gel based desiccant wheels, the water molecules are transferred by sorption, individually, onto and off of the silica gel surface. Water is present on the wheel in a molecular layer only. Condensation does not occur. Airxchange desiccant wheels experience “dry” moisture transfer in that there is no bulk liquid water present which could support fungal growth or dissolve other chemical species. The transfer of water onto and off of the wheel’s desiccant surfaces occurs in the vapor or gas phase. There are no “wet” surfaces and liquid water does not enter the airstream.

The sensible (non-desiccant coated) wheel can also transfer water through the different mechanism of condensation and re-evaporation, however; again, there is no accumulation of water, unless the frosting threshold is violated through misapplication of the component. In this case, the water is in the form of frost or ice which does not support fungal growth. Sensible (uncoated) wheels from all manufacturers are identical in this regard.

Both moisture and nutrients are required to support fungal growth. Therefore dirt accumulation on heat wheels is of potential concern. It is also true that any heat wheel can accumulate semi-volatile compounds like tars and grease which are deposited on surfaces. These surfaces can then become odor and contaminant sources, in the same way that a filter or any other element of an air handling system can become a source of compounds accumulated over time. The Airxchange wheel was designed to respond to these issues over the life of the system by providing for cleaning and maintenance with washable desiccant surfaces, removable segments and easy to access cassettes. Many aspects of this technology are patented and are unique in the industry.