

Tech Talk - False Illusions About Vestibules And Automatic Doors - The HVAC Perspective

Here is the challenge for you, it doesn't matter if you are in a cold climate or hot-humid climate, go observe the operation of entrance doors and the customer traffic patterns of some restaurants, retail stores, hotels, office complexes, hospitals or any other type of facility that has a door by which people enter the building. You will soon see that vestibules are a false sense of security when it comes to offsetting infiltration and saving energy as compared to using an air door in combination with or in place of the vestibule. Granted, vestibules serve as good "walk-off" paths for wet and dirty shoes and sometimes serve as a good location for spontaneous purchasing product displays; however, they alone are not the most effective way to prevent infiltration. Many times vestibules are equipped with cabinet heaters which serve to either recover the set point temperature after the outside air blows in or they are used to sub-cool or overheat the vestibule to attempt to use the vestibule cavity as a mixing chamber to minimize the impact of the air blowing into the facility directly onto customers and employees standing, seating or working near the entrance.

There are a variety of architectural details that attempt to deal with infiltration and drafts from outside winds. There are a variety of engineering attempts to install cabinet heaters to compensate for the rush of cold air entering the building. Sometimes assumptions are made that the building's positive pressure will prevent a blowing wind from entering a building. None of these are as effective as using an air door at the entrances and are essentially a waste of money from a practical standpoint. A wind is a force that needs to be resisted by another force of equal or greater value.....that is what an air door is specifically designed to do.

An engineer who does the math using the basic sensible load calculation, $BTUH = CFM \times 1.08 (T1 - T2)$, will quickly see that the infiltration sensible load is a large load to deal with. Most times it is not possible to install a cabinet heater of sufficient capacity to instantaneously offset this gust of cold air that enters through the vestibule. An engineer may rationalize that over heating or reactively re-heating the vestibule with a cabinet heater is as good as can be done. This is not true.....an air door is more effective in preventing the cold air from blowing into the building at all. In hot humid climates the humidity load can have as much or worse of an impact on the building energy use and comfort if the infiltration is not dealt with appropriately.

A simple economic payback analysis is a good way to start an evaluation of the use of air doors in designs. It doesn't cost anything to let Powered Aire run a payback analysis for the application. The facility owner will be glad that the engineer took the time to think outside of the box and look at air doors as an effective energy savings method and to provide solutions to operational comfort issues that they live with long after the design is complete.

Application Consideration

Air doors made of stainless steel provide both an engineering and architecturally pleasing solution to infiltration. Powered Aire has National Account customers who have realized that such an installation is the wise decision for their facilities for both energy savings and customer and employee comfort. Why bother installing products in operating facilities in a manner that is not effective and wastes energy? Air doors are specifically designed for the purpose of dealing with infiltration and are the best choice for entrances.

