

Tech Talk - Commissioning of Air Doors

The commissioning of HVAC products is just a small part of the total building commissioning process; however, it is an important part of the process because many of the HVAC products in an HVAC system consists of moving parts that must function properly and be controlled properly to provide the results intended. Air curtains are an engineered product that are applied with the intent of protecting an opening in a wall from wind, insects, odor or thermal migration. The effectiveness of an air curtain depends on the force vector that the “air curtain” provides over the opening. This air force is generally from above the opening but can be from the sides also in special applications. The commissioning of an air door involves the calibration of the control components, fan, motors, filters and other physical components of the air curtain unit. The commissioning also involves ensuring that the unit is properly mounted and that the nozzle is properly adjusted to provide the “air curtain” force needed.

The adjustment of the “air curtain” is both in velocity and in direction. The velocity may be fixed if the air curtain unit is a single speed unit; however, many air curtain units are provided with either dual speed or variable speed controls so that the “air curtain” can be varied depending on the needs at various times. In the winter it may be desirable to have a stronger air curtain force to offset stronger cold winter winds but in the summer less force might be needed. In mild weather where thermal protection is not needed and insect control isn't the objective, the air curtain may be completely turned off.

It must be understood that “commissioning” is not the same as a system start-up. Commissioning is a process that begins at the beginning of a building design process and extends through the design process, construction process, start-up process and facility operations. The best way to explain this is to look at the purpose of commissioning as proposed by the Building Commissioning Association: *"The basic purpose of building commissioning is to provide a quality based process with documented confirmation that building systems are planned, designed, installed, tested, operated and maintained in compliance with the Owner's Project Requirements. Commissioning of existing systems may require the development of new functional criteria in order to address the owner's current systems performance requirements."* (www.bcx.org).

For air curtain applications this means that the applications of air doors needs to be understood in context with the total building environment objective. The air curtain selection must take into account not only the purpose of the air curtain (stopping wind, insects, odor, thermal migration, etc.) but also must be designed to integrate with the other components in the HVAC system and other building components — structural, architectural, electrical, etc.

Application Consideration

Basic Air Curtain Commissioning considerations:
Design criteria evaluation — why is it needed.
Product selection consideration — what is needed.
Product specification — how should it function.
Product submittal — who is being provided.
Product installation — how is it being installed.
Product calibration — how is it operating
System integration— how does it fit in the total system
System operation—who, what, when, why and how is the air curtain being utilized by and is it being properly utilized to realize the original design criteria and intent.

Air doors have been underutilized in the building industry for many years. It is time that engineers begin to consider air doors as a first choice in energy conservation when it comes to infiltration control. Air doors are the most effective way to deal with localized infiltration at doors and service type windows.

