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Subject: Dedicated Outdoor Air Systems (DOAS) and Performance Testing

Dear Mr. ,

The CSA C746 standard is the *Performance Standard for Rating Large and Single Packaged Vertical Air Conditioners and Heat Pumps*. This standard defines a commercial and industrial unitary air conditioner or heat pump as;

A factory-made assembly that normally includes an indoor conditioning coil, an air-moving device, one or more compressors, and one or more outdoor coils. In the case of an air conditioner, it can include a heating function in addition to the cooling function. In the case of a heat pump, it can include a cooling function in addition to the heating function.

Notes:

- (1) *Commercial and industrial unitary air conditioners provide, alone or in combination with a heating plant, air circulation, cooling, and dehumidifying functions and can include heating, humidifying, outdoor air ventilation, and air cleaning functions.*
- (2) *Commercial and industrial unitary heat pumps provide heating and air circulation functions and can include air cooling, dehumidifying, humidifying, outdoor air ventilation, and air cleaning functions.*
- (3) *When this equipment is provided in more than one assembly, the separate assemblies are designed to be used together, and the rating requirements specified in this Standard are based on the use of matched assemblies.*

The performance requirements outlined in section 7 of CSA C746 state that equipment covered by this standard shall meet the testing requirements of ARI 340/360. These requirements for Standard Rating and Part Load conditions require a specific Indoor and Outdoor, Wet and Dry Bulb temperature.

In contrast, the AHRI standard that applies specifically to DOAS is AHRI Standard 920 the *Performance Rating of DX-Dedicated Outdoor Air System Units*. The scope of this standard specifically states that it excludes products covered under ANSI/AHRI Standard 210/240, ANSI/AHRI Standard 340/360, and ANSI/AHRI/ASHRAE ISO Standard 13256-1. The standard defines a DOAS as follows;

DX-Dedicated Outdoor Air System Units (DX-DOAS Units); A type of air-cooled, water-cooled, or water source factory assembled product which dehumidifies 100% Outdoor Air to a low dew point, and includes reheat that is capable of controlling the supply dry-bulb temperature of the dehumidified air to the designed supply air temperature. This conditioned outdoor air is then delivered directly or indirectly to the Conditioned Space(s). It may pre-condition Outdoor Air by containing an enthalpy wheel, sensible wheel, desiccant wheel, plate heat exchanger, heat pipes, or other heat or mass transfer apparatus.

Note: DX-DOAS Units can operate in combination with a separate sensible cooling system to satisfy the entire building humidity load. The system is sized to maintain a prescribed ventilation rate under any load condition. The ventilation rate can be constant or varied based on the building operation or occupancy schedule or in response to the actual occupancy. It may pre-condition Outdoor Air by incorporating an enthalpy wheel, sensible wheel, desiccant wheel, plate heat exchanger, heat pipes or other heat or mass transfer apparatus. It shall reheat the ventilation air by containing a reheat refrigerant circuit, sensible wheel, heat pipe, or other heat or mass transfer apparatus. Cooling components may include chilled water coils. Heating components are optional and may include electrical resistance, steam, hot water, or gas heat. In addition, it may provide for air cleaning

By definition equipment that operates at 100% outside air is considered a DOAS unit and is not covered under AHRI 340/360 or CSA C746. At this time AHRI doesn't have a program for this product, nor is there a lab available capable of achieving the conditions specified in the AHRI 920 standard.

Regards,

Tim Dovi
Engineering Team Lead