**INTERPRETATION IC 90.1-2004-2 OF**
**ANSI/ASHRAE/IESNA STANDARD 90.1-2004**
**Energy Standard for Buildings Except Low-Rise Residential Buildings**

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**Reference:** This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IESNA Standard 90.1-2004, Section 6.5.3.1 Fan Power Limitation, and Table 6.5.3.1, specifically relating to fan power limitation ratios.

**Background:** For HVAC systems having a total fan system power exceeding 5 hp, Section 6.5.3.1(a) states, "The ratio of the fan system power to the supply fan airflow rate (main fan) of each HVAC system at design conditions shall not exceed the allowable fan system power shown in Table 6.5.3.1."

Table 6.5.3.1 indicates maximum allowable nameplate motor horsepower based on either constant volume systems or variable air volume systems at a low (<20,000 cfm) and high (≥20,000 cfm) supply air flow rates.

These limitations are obtainable for most facilities including laboratories, but I continue to find it difficult to achieve these limits for animal housing and facilities (vivarium). The high air flow rates required by AAALAC and NIH, the HEPA filtration requirements, the air flow or space pressure control terminal units, and the need to maintain temperature and humidity with high flow rates to flush the contaminants makes compliance next to impossible where air change rates are set by researchers and standards, animal (Not Human) health and safety is the issue and millions of dollars are at stake if outside air flows are not maintained and all air must be exhausted through heat recovery coils and associated filters.

Please consider the animal health and safety imposed in vivarium, vivarium support and animal operating or procedure rooms:
• Elevated air flow requirements in cage wash areas to remove heat and humidity from process equipment.
• Elevated air flows in animal holding areas to remove contaminants and maintain animal health.
• Necropsy rooms with high air change and static pressures for human safety.
• Increased cooling and dehumidification loads with 100% outside air require greater rows and fins (pressure drop) at cooling coils.
• Increased heating loads with 100% outside air require greater rows and fins (pressure drop) at preheat coils.
• Heat recover coils (a must with this amount of OA) at AHUs.
• Higher filter pressure drops due to higher levels of filtration as compared to a research lab.
• 100% exhaust with limited VAV allowed.

**Interpretation:** Section 2.5 states "This standard shall not be used to circumvent any safety, health, or environmental requirements." This applies to all facilities and includes the health and safety of animals as well as humans.
Due to the increased HVAC requirements of vivaria for the purposes of human and animal health and safety, the fan powered limitation will not apply to vivarium space and vivarium systems are exempt from this requirement. If all other elements of the prescriptive method are met, a full building energy analysis is not required even though the fan power limitation is not met.

**Question:** Is this interpretation correct?

**Answer:** No

**Comments**: These air distribution systems are not process loads and would be covered by the fan power limitations requirements, however no parts of 90.1 shall be used to circumvent any safety, health, or environmental requirements (Section 2.5). Furthermore, the Fan Power Working Group realized the challenges to comply with the current standard when a complex fan system is in place. The Group is currently addressing this in their proposed changes to recognize the pressure drops through these systems.