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Solar Attic Fans: BEWARE of False Ventilation Claims

How many square feet of attic space can a Solar Attic Fan ventilate according to the International Building Code of 2006?

By Martin K Kolt – President, Active Ventilation Products, Inc.

There seems to be a common yet serious mistake being made by leading architectural and engineering professionals today. The mistake is in believing the outrageous ventilation claims being made by many popular solar attic fan manufacturers. The solar fan manufacturers mislead their would be customers by falsely advising how many square feet their solar attic fan can effectively ventilate in accordance to building code.

According to the building codes there are only two types of ventilators recognized. The two types are: electric, which operate on A/C power; and all others (wind powered, solar powered and passive vents). There is an engineering reason for only two categories. In creating guidelines for ventilation in the building codes, it was understood that a certain amount of CFM (cubic feet per minute) of air movement must be achieved for the structure to be adequately ventilated. Which product can deliver guaranteed CFM performance? Only an A/C electric powered fan can guarantee CFM performance in all weather conditions. Ventilation must be on-going. The belief that ventilation should only take place when the sun is at its zenith or close to it, is a terrible mistake. Ventilation must occur when it is sunny or cloudy, day or night.

The standard passive ventilation requirement of 1 square foot of ventilation for every 300 square feet of attic floor is also known as the "1 to 300 rule." All non-electric vents must be calculated into a building design by the "1 to 300 rule", no matter if it is wind driven, solar powered or passive. The reason for this is simple. As long as the CFM rates cannot be definitely calculated, the calculation must be based on the area of the vent's diameter (free air space) in relation to the size of the attic being vented.

An example of this building code regulation is with the Wind Powered Roof Turbine Vent commonly known as the Whirly Bird. The defining feature of this product is that it uses wind to actively draw air from the attic space. This wind powered roof turbine vent has proven to be an effective ventilator for over 100 years. By design, different wind speeds produce different amounts of CFM. So higher wind speeds produce higher amounts of CFM exhaust rates. But the building codes still do not provide any allowances for this added ventilation. The installation of wind turbines must still comply with the "1 to 300 rule". The reason for this is simple; what if there is no wind? Then the CFM calculations and any aggressive installation program would be flawed. This would result in over-heated attics in the summer, moisture laden attics in the other two seasons and ice damming in the winter. Building codes must deal with what is, not with what could be.

A solar attic fan also has the same issue with establishing a CFM consistency (standard). The CFM is subjective or has too many factors using a solar source. First, on a hot sunny day there could be a light cloud covering or passing clouds. This factor would seriously compromise performance. Secondly, solar panels must be kept perfectly clean in order to function at maximum capacity. Thirdly, the position of the panel is also a factor. If the solar panel is positioned in the best position, how many hours would this solar panel get direct sunlight? In Arizona, to facilitate the production of the maximum amount of electricity, the solar panels are mounted onto servos that move with the sun. This increased the amount of electricity produced by hundreds of percent. This is not the case with a stationary solar panel: direct strong sunlight can only last one to three hours depending on the latitude of the location.

Provided that the weather is completely sunny, the solar panel is perfectly clean and is facing in the right direction with direct sunlight similar to the summer months that have the strongest rays, only then could the maximum amount of CFM be achieved.

The CFM rates being advertised by manufacturers are at peak performances which occur only in perfect conditions. Solar fans are extremely sensitive and any variable mentioned above plus other factors not mentioned here can and will dramatically affect your solar fans CFM performance. Any aggressive installation calculations would result in an

under-vented attic.

For the above reasons and more, the Solar Attic Fan should still be calculated at the "1 to 300 rule" and not beyond. Any additional performances that the solar fan can provide should not be acknowledged and calculated into the installation design. One should rely solely on the calculations for ventilation based on the net free air inches of the roof vent or fan in relation to the attic space being ventilated. The benefit of the solar power would be an auxiliary hot air exhaust on those hot sunny summer days, but should not be used to calculate beyond its net free air space.