



13 June 2007

Chris Gekas
California Energy Commission
1516 Ninth Street, MS 25
Sacramento, CA 95814-5512

Dear Mr. Gekas:

This is in response to CEC's open request for public comment relative to the 2008 Building Energy Efficiency Standards.

Specifically this comment relates to a provision under the proposed changes for residential mechanical ventilation as listed below:

"3. If performance approach is not used, the total fan power used to meet this requirement shall not exceed 1.2 W/cfm of required ventilation air. If performance approach is used, total fan power in the standard design is equal to the proposed house but not greater than 1.2 W/cfm of required ventilation air."

It is not clear what the background and basis of this proposed requirement is.

On an instantaneous analysis basis, all exhaust fans and most HRV/ERV units will meet the 1.2 W/cfm requirement, but air handler based ventilation systems will not. As shown in Table 1, an exhaust fan drawing 25 watts and moving 50 cfm continuously would amount to 0.5 W/cfm, an HRV/ERV drawing 165 watts and moving 150 cfm continuously would amount to 1.1 W/cfm, and a 1000 cfm air handler fan drawing 500 watts and moving 150 cfm of ventilation air continuously would amount to 3.3 W/cfm.

However, on an average analysis basis, a central-fan-integrated supply system moving 150 cfm of ventilation air intermittently at a 33% minimum runtime only needs to run an additional 15% to 20% of the time for ventilation only. The rest of the time, distribution of ventilation air is coincident with demand for heating and cooling. This has been shown in monitoring and modeling studies (see References below). The worst case shown in Table 1 shows that, with an 800 watt air handler fan moving 150 cfm 20% of the time for ventilation only, the 1.2 W/cfm or less requirement is still met.

Table 1 Ventilation fan W/cfm calculated with an annual average runtime fraction for ventilation

	watts	cfm	run fraction for vent only	W/cfm
exhaust fan	25	50	1.0	0.5
HRV/ERV	165	150	1.0	1.1
	165	150	0.333	0.4
central-fan-integrated supply	500	150	1.00	3.3
	500	150	0.15	0.5
	500	150	0.20	0.7
	800	150	0.15	0.8
	800	150	0.20	1.1

I have also attached (electronically) a worksheet that expands on the analysis of Table 1. The worksheet shows the W/cfm of delivered ventilation air for a range of variables, including: house size and number of bedrooms to determine the 62.2 ventilation flow rate, controlled minimum fan duty cycle, fan flow rate and power draw, and the annual average runtime fraction for ventilation only. To summarize the results, as long as the central-fan-integrated supply ventilation system does not need to run much more than 25% of the time for ventilation only, then the annual average W/cfm of delivered ventilation air would be less than 1.2 W/cfm.

Please provide more information on the background and basis of the 1.2 W/cfm requirement. I believe that the CEC proposed change should include a simple means to show code compliance not just based on an instantaneous analysis but also based on an average basis that allows for a fan runtime fraction for ventilation only.

I appreciate your consideration of this public comment and I look forward to your response.

Respectfully,

Armin Rudd
Principal

References

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