

**INTERPRETATION IC 90.1-2004-34 OF
ANSI/ASHRAE/IESNA STANDARD 90.1-2004
Energy Standard for Buildings Except Low-Rise Residential Buildings**

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Request from: Jeffrey Paresa, PE (jeffrey.paresa@wsplincolnescott.com), WSP Lincolne Scott, Honolulu, HI 96813.

Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IESNA Standard 90.1-2004, Table G3.1 and Sections G3.1.2.8 and 3.1.2.9, regarding modeling requirements for baseline fan power.

Background: We have submitted a project for LEED certification and received comments from the GBCI reviewer in which we disagree and require an official interpretation to resolve the disagreement.

Originally, we had used Table G3.1 No. 12 - Receptacles and other Loads to model the baseline toilet exhaust fan motor power and set the baseline power equal to the proposed. We were advised this was not correct and that we must use the fan power equation in Section G3.1.2.9 to model the exhaust fan power. We revised our calculations and separately calculated baseline supply fan power and baseline exhaust fan power where the supply fan power calculation used baseline design supply flow rate and the exhaust fan power calculation used baseline design exhaust flow rate.

We subsequently received a follow-up comment from the GBCI reviewer that separately calculating baseline fan power for supply and exhaust fans using the equation in Section G.3.1.2.9 is incorrect and that we must use the baseline design supply flow rate only to determine baseline fan power for all the project fans, that is, the exhaust fan flow rate does not get used in the fan power equation.

We disagree with this interpretation as this approach would not properly represent baseline fan power. The proportion of exhaust fan flow rate to supply fan flow rate may vary substantially depending on the type of project. There may be projects that include commercial kitchens or say garage exhaust fans or other exhaust air streams that have disproportionately high exhaust flow rates compared to supply flow rates. Not accounting for exhaust fan flow rates in many cases would lead to gross understatement of baseline fan power.

Additionally, if the equation in G3.1.2.9 is supposed to include only supply air flow, but represent fan power for all fans, it would be in conflict with Section G3.1.2.8 which states that if the project has return or relief fans in the proposed design they should also be modeled with fans serving the same functions and sized for the baseline system supply air fan air quantity less the minimum outdoor air, or 90% of the supply fan air quantity, whichever is larger.

Interpretation No. 1: Table G3.1 No. 12 should be used for determining fan power from equipment such as toilet, garage, or general exhaust fans.

Question No. 1: Is this interpretation correct?

Answer No. 1: No.

Comments No. 1: If the space use classification for a zone or thermal block is *semi-heated* or *unconditioned* then that space's fan power from equipment such as toilet, garage, or general exhaust fans would be the same between the baseline and proposed per Table G3.1 No. 12. If the space use classification for a zone or thermal block is *conditioned* then G3.1.2.9 is used to determine baseline system total fan power.

Per Appendix G the total system fan power for baseline system(s) serving *conditioned* spaces is specified independently of the proposed building, enabling credit for more efficient fan systems. System fan electrical power for supply, return, exhaust and relief fans is calculated based on the formulas in G3.1.2.9. The power from this formula includes supply, return, relief, and exhaust fans, but excludes power to fan-powered VAV boxes when these are part of the baseline building HVAC system (systems 6 and 8). The calculated system fan power shall be distributed to supply, return, exhaust, and relief fans in the same proportion as the proposed design.

Interpretation No. 2: Only supply air flow rate (excluding exhaust flow rate) should be used in the Section G3.1.2.9 fan power equation to calculate fan power from supply and exhaust fans even if the exhaust fans are independent and unrelated system such as toilet exhaust, garage, or general exhaust fans.

Question No. 2: Is this interpretation correct?

Answer No. 2: Yes.

Interpretation No. 3: Supply and exhaust fans should be calculated separately when using the fan power equation in Section G3.1.2.9.

Question No. 3: Is this interpretation correct?

Answer No. 3: No.

Comments No. 3: The calculated system fan power shall be distributed to supply, return, exhaust, and relief fans in the same proportion(s) as the proposed design.