

Low-rise dwelling-unit outdoor air

2024 model IMC 403.3.2.1 / Equation 4-9

For Group R-2, R-3 and R-4 dwelling units in buildings three stories or fewer, use the 2024 IMC model-code whole-house outdoor-air screen. Confirm occupancy, adopted edition, amendments and project scope before design or permit use.

Whole-house continuous-equivalent rate

QOA (cfm) = $0.03 \times \text{Afloor (ft}^2\text{)} + 7.5 \times (\text{Nbr} + 1)$. Afloor is dwelling-unit floor area; Nbr is bedroom count, with a minimum value of 1. The area coefficient is 0.03.

Conditional 30% reduction - document all three

- Outdoor air is ducted directly to every bedroom.
- Outdoor air is ducted directly to at least one living room, dining room or kitchen.
- The whole-house outdoor-air ventilation system is balanced; document supply and exhaust airflows.

A return-air connection alone does not establish the room-distribution condition. If any condition is unknown, keep the unreduced rate.

Example: 2,000 ft² and 3 bedrooms

$0.03 \times 2,000 + 7.5 \times (3 + 1) = 90$ cfm continuous-equivalent. Only with all three reduction conditions documented: $90 \times 0.70 = 63$ cfm continuous-equivalent.

Intermittent operation - preserve the average rate

Exception 1 has two separate requirements: controls enable operation for at least 60 minutes in every 240-minute period, and the four-hour average outdoor airflow is at least the Equation 4-9 rate. For the unreduced 90-cfm example, exactly 60 minutes at 360 cfm gives a 90-cfm average. A 59-minute cycle does not qualify, even with more airflow. Do not assume the separate 30% reduction combines with this intermittent path; confirm the adopted text before applying both.

Show on the plans

Dwelling-unit area and bedrooms; applicable 2024-model or adopted-code basis; direct room distribution and balance evidence if reduced; operating airflow, schedule and controls if intermittent; other local-exhaust and common-area duties separately.

Source: 2024 International Mechanical Code, 403.3.2.1 and Equation 4-9. Educational model-code packet; not fan selection, sealed design, code determination or permit approval. Engineering services require a written scope.