

Demand Control Ventilation Update (435)

Modify the 2021 International Energy Conservation Code as follows:

Revise as follows:

C403.7.1 Demand control ventilation.

Demand control ventilation (DCV) shall be provided for all single-zone systems required to comply with Sections C403.5 through C403.5.3 and spaces larger than 250 500 square feet (23.246.5 m²) in climate zones 5A, 6, 7 and 8 and spaces larger than 500 square feet (46.5m²) in other climate zones and with an average occupant load of 15 people or greater per 1,000 square feet (93 m²) of floor area, as established in Table 403.3.1.1 of the International Mechanical Code, and served by systems with one or more of the following:

1. An air-side economizer.
2. Automatic modulating control of the outdoor air damper.
3. A design outdoor airflow greater than 3,000 cfm (1416 L/s).

Exceptions:

1. Spaces served by sSystems with energy recovery complying with and required by Section C403.7.4.2. that have floor area less than:
 - 1.1 6000 square feet (2557m²) in climate zone 3C
 - 1.2. 2000 square feet (186m²) in climate zones 1A, 3B and 4B
 - 1.3. 1000 square feet (93m²) in climate zones 2A, 2B, 3A, 4A, 4C, 5 and 6.
 - 1.4 400 square feet (37m²) in climate zones 7 and 8.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. Multiple-zone systems with a design outdoor airflow less than 750 cfm (354 L/s).
4. Spaces where more than 75 percent of the space design outdoor airflow is required for makeup air that is exhausted from the space or transfer air that is required for makeup air that is exhausted from other spaces.
5. Spaces with one of the following occupancy classifications as defined in Table 403.3.1.1 of the *International Mechanical Code*: correctional cells, education laboratories, barber, beauty and nail salons, and bowling alley seating areas.

Reason:

The proposal lowers the area threshold from 500 to 250 square feet for spaces in cold climate zones, as there is a greater cost to condition outdoor air. Further, demand-controlled ventilation will provide cost effective savings for systems with energy recovery, although the space size threshold will be larger than the general threshold set in the charging language. The exceptions for energy recovery, rather than being a blanket exception, will now increase the area threshold relative to the savings that DCV will achieve with energy recovery. These thresholds are based on a cost-effective analysis for addendum b to ASHRAE Standard 90.1-2019 that showed cost effectiveness for smaller areas generally. To avoid complexity, climate zones have been grouped for simplification here.

Cost Impact:

The code change proposal will increase the cost of construction.

Typical cost for space DCV controls is \$350. When there is energy recovery, DCV savings is reduced so the threshold in the revised charging language is not cost effective. For larger spaces, more outdoor air is required, and cost effectiveness is valid over at larger space area thresholds depending on the cost of outdoor air conditioning.