

2024 IECC

NBI has submitted proposals into the ICC process to advance the 2024 IECC. The proposed amendments cover a wide range of measures and improve the code by adding additional efficiency, clarifying requirements, and creating greater flexibility for code users and local jurisdictions. Learn more at newbuildings.org/code_policy/2024-iecc-national-model-energy-code-base-codes.

Code Change Title: Dedicated Outdoor Air System (DOAS) **CEPI-98-21**

Summary: Requires commercial buildings to install a DOAS system, separating ventilation from space conditioning.

Revise text as follows:

~~**C403.3 Heating and cooling equipment efficiencies**~~ **Equipment selection.** Heating and cooling equipment installed in mechanical systems shall be sized in accordance with Section C403.3.1 and shall be not less efficient in the use of energy than as specified in Section C403.3.2.

Add new text as follows:

C403.3.5 Dedicated outdoor air systems (DOAS). Outdoor air shall be provided to each occupied space by a dedicated outdoor air system (DOAS) which delivers 100 percent outdoor air without requiring operation of the heating and cooling system fans for ventilation air delivery, as required by Table C403.3.5. For DOAS having a total fan system motor nameplate hp less than 5 hp, total combined fan power shall not exceed 1 W/cfm of outdoor air. Total fan power limits of Section C403.8.1 shall apply to each outdoor air unit of the DOAS and shall not include the fan power associated with the zonal heating and cooling equipment.

Exceptions:

1. Use groups listed as exempted in Table C403.3.5
2. Occupied spaces that are solely ventilated by a natural ventilation system in accordance with Section 402 of the International Mechanical Code;
3. Buildings where the cooling and heating equipment exceeds the minimum efficiency requirements listed in the tables in Section C403.3.2 by 10 percent. Where multiple cooling performance requirements are provided, the equipment shall exceed the rating requirement, including IEER, SEER and IPLV as applicable. This exception shall not be used as a substitution for the more efficient HVAC equipment credit option per C406.2.
4. Buildings with underfloor air systems

TABLE C403.3.5

Occupancy Classifications Requiring DOAS

<u>OCCUPANCY CLASSIFICATIONS</u>	<u>COVERED USE GROUPS</u>	<u>EXEMPTED USE GROUPS</u>
<u>A-1</u>	<u>All occupancies</u>	<u>Television and radio studios</u>
<u>A-2</u>	<u>Casinos (gaming area)</u>	<u>All other use groups</u>
<u>A-3</u>	<u>Lecture halls, community halls, exhibition halls, gymnasiums, courtrooms, libraries, places of religious worship</u>	<u>All other use groups</u>
<u>A-4, A-5</u>		<u>All use groups</u>
<u>B</u>	<u>All use groups not specifically exempted</u>	<u>Food processing establishments including commercial kitchens, restaurants, cafeterias; laboratories for testing and research; data processing facilities and telephone exchanges; air traffic control towers; animal hospitals, kennels, pounds; ambulatory care facilities.</u>
<u>F, H, I, R, S, U</u>		<u>All use groups</u>
<u>E, M</u>	<u>All use groups</u>	

C403.3.5.1 Heating/cooling system fan controls. Heating and cooling equipment fans, heating and cooling circulation pumps, and terminal unit fans shall cycle off and terminal unit primary cooling air shall be shut off when there is no call for heating or cooling in the zone.

Exception:

Fans used for heating and cooling using less than 0.12 watts per cfm may operate when space temperatures are within the set point dead band to provide destratification and air mixing in the space.

C403.3.5.2 Decoupled DOAS supply air. The DOAS supply air shall be delivered directly to the occupied space or downstream of the terminal heating and/or cooling units.

Exceptions:

1. Active chilled beam systems.
2. Sensible only cooling terminal units with pressure independent variable airflow regulating devices limiting the DOAS supply air

to the greater of latent load or minimum ventilation requirements.

3. Terminal heating and/or cooling units that comply with the low fan power allowance requirements in the exception of Section C403.3.5.1.

Revise text as follows:

C403.7.4 Energy recovery systems. Energy recovery ventilation systems shall be provided as specified in Section C403.7.4.3 and either Section C403.7.4.1 or C403.7.4.2, as applicable.

Add new text as follows:

C403.7.4.3 Spaces with Dedicated Outdoor Air Systems (DOAS). Dedicated outdoor air systems (DOAS) shall include energy recovery ventilation in call cases and shall be in accordance with either Section C403.7.4.1 or C403.7.4.2, as applicable.

Exceptions: Systems installed for the sole purpose of providing makeup air for systems exhausting toxic, flammable, paint, or corrosive fumes or dust, dryer exhaust, or commercial kitchen hoods used for collecting and removing grease vapors and smoke.

Revise text as follows:

C406.1 Additional energy efficiency credit requirements. New buildings shall achieve a total of 10 credits from Tables C406.1(1) through C406.1(5) where the table is selected based on the use group of the building and from credit calculations as specified in relevant subsections of Section C406. Where a building contains multiple-use groups, credits from each use group shall be weighted by floor area of each group to determine the weighted average building credit. Credits from the tables or calculation shall be achieved where a building complies with one or more of the following:

5. Where not required by Section C403.3.5, the pProvision of a dedicated outdoor air system for certain HVAC equipment in accordance with Section C406.6.

The majority of commercial HVAC systems are based around a central air handling delivery system. This system typically provides heating, cooling and ventilation air from a single source. Since cooling is typically the largest instantaneous load, the fans must be sized large enough to deliver enough air to meet the peak cooling requirements. When the ventilation is integrated, these large fans must operate during all occupied hours to deliver ventilation effectively to the space. This leads to very high fan energy use. Through the use of a Dedicated Outdoor Air System (DOAS) ventilation can be separated from the

heating and cooling delivery and the large heating/cooling fans can be shut off unless there is a call for heating or cooling and the much smaller ventilation-only fans can operate to deliver fresh air to the space. Furthermore, when the DOAS is combined with a Recovery Ventilation (ERV) the heating energy requirements associated with tempering the ventilation air are significantly reduced or eliminated.