

State of Washington DOAS Commercial Building Code Takes Effect July 1, 2017

Summary

Washington State, while adopting the 2015 International Energy Conservation Code, passed a new [commercial construction code](#) that requires a Dedicated Outdoor Air System (DOAS) with energy recovery for office, education, and retail buildings; and for libraries and fire stations ([WAC 51-11C-40360](#), Section C403.5 and Section C403.6). Commercial spaces have been required to supply outdoor airflows at set volumes for decades. What is new is **separating** ventilation air from the “HVAC” system--from typical heat/cool equipment’s high-wattage, high-volume blowers needed to achieve comfortable indoor temperatures. Now, the heating and cooling system must be able to be turned **off**, while the ventilation continues, whenever those temperatures are correct. The intent of the new code is to save 30% to 60% of HVAC energy, in Ecotope’s analysis of three “base case” buildings provided to the State of Washington.¹ To reach those savings, the DOAS must also include energy recovery technology and bypass economizer operation.

Code Highlights

C403.5: “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.”

(Exceptions:

- 1. Occupied spaces that are not ventilated by a mechanical ventilation system and are only ventilated by a natural ventilation system per Section 402 of the International Mechanical Code.*
- 2. High-efficiency variable air volume (VAV) systems complying with Section C403.7, which has 16 criteria the VAV system must meet.)*

C403.6.1- Energy recovery ventilation requirement: ““The DOAS shall include energy recovery ventilation that complies with the minimum energy recovery efficiency and energy recovery bypass requirements, where applicable, of **Section C403.5.1.**”

(Exceptions:

- 1. High-occupancy areas (>25 people per 1000 sq ft) if Demand Control outdoor air can be reduced >50%.*
- 2. Systems installed for the sole purpose of providing makeup air for exhaust systems: fumes, dust, kitchen grease, smoke, and other pollutants.)*

C403.5.1 - Minimum energy recovery efficiency: “The energy recovery system shall have the capability to provide a change in the enthalpy of the outdoor air supply of not less than 50 percent of the difference between the outdoor air and return air enthalpies, at design conditions. Where an air economizer is required, the energy recovery system shall include a bypass or controls which permit operation of the economizer as required by Section C403.3.” (Specific design airflow rates are required, according to percent outdoor air supplied, climate zone, and annual hours operating.)

(Exceptions: 9 exceptions, primarily in hazardous exhaust systems; for high-efficiency VAV systems; dehumidification conditions; and for cooling energy in cold climate zones.)

NEEC Provides Guidance and Training

Northwest Energy Efficiency Council is the source of energy code technical assistance and regular trainings for 'non-residential' building owners, including multi-family owners; commercial HVAC system designers including architects, engineers, and energy consultants; and general and mechanical contractors. NEEC is a non-profit trade association for "the energy efficiency industry" with a mission to influence energy policy in Oregon, Idaho, and Montana as well as Washington.

- [NEEC holds trainings around Washington](#) and will publish a "DOAS Design Guide" by a team that includes Jonathan Heller (Ecotope), and Duane Lewellyn (NEEC's Smart Buildings Center). When drafts are available, Ventacity plans to contribute.
- On [May 24, 2017 a 3.5 hour training](#) in Vancouver, WA covered the new DOAS requirement as well as other mechanical systems energy codes. Other training may be offered by [NEEC](#).
- [NEEC Energy Codes Website](#) provides many resources for four states, such as Compliance Forms: *"NEEC provides technical assistance, compliance forms, and educational resources for the Commercial Provisions of the WSEC. Commercial Provisions apply to all commercial occupancies, Group R-2 and R-3 occupancies greater than 3 stories above grade, and Group R-1 of all building heights. Many building jurisdictions require that Compliance Forms accompany project permit submittals as a means of documenting the method of compliance of all applicable commercial provisions. Educational resources include classroom trainings, webinars, fact sheets and other informational tools."*

NEEC's technical support team responds to questions and technical resource inquiries.

Email WSEC@neec.net

Telephone the technical support team manager - Lisa Rosenow, 206-624-0283

Ventacity Systems has products and engineers to help too, call any time: 503-208-7331

1 Heller, Jonathan, and NEEA. "2015 Washington State Energy Code Development Standard Energy Code Proposal Form" (2015, March 10). State of Washington State Building Code Council submission, pages 3-4, 6. (Available online @ <https://ventacity.box.com/s/jmfnrrog7a5c0gaq41773htq65bdo7a8>)