

C503.4 Mechanical systems. Those parts of systems which are altered or replaced shall comply with Section C403 unless specifically exempted in this section. Additions or alterations shall not be made to an existing mechanical system that will cause the existing mechanical system to become out of compliance.

Exceptions:

1. Existing mechanical systems are not required to be modified to comply with Section C403.3.5 which are altered or where parts of the system are replaced are not required to be modified to comply with Section C403.3.5 as long as where mechanical cooling capacity is not added to a system that did not have cooling capacity prior to the alteration.
2. Compliance with Section C403.1.4 is not required where the alteration does not include replacement of a heating appliance.
3. Alternate mechanical system designs that are not in full compliance with this code may be approved when the code official determines that existing building constraints including, but not limited to, available mechanical space, limitations of the existing structure, or proximity to adjacent air intakes or exhausts make full compliance impractical. Alternate designs shall include additional energy saving strategies not prescriptively required by this code for the scope of the project including, but not limited to, demand control ventilation, energy recovery, or increased mechanical cooling or heating equipment efficiency above that required by Tables C403.3.2(1) through **C403.3.2(126).**
4. Only those components of existing HVAC systems that are altered or replaced shall be required to meet the requirements of Section C403.8.1. Allowable fan motor horsepower. Components replaced or altered shall not exceed the fan power limitation pressure drop adjustment values in Table C403.8.1(2) at design conditions. Section C403.8.1 does not require the removal and replacement of existing system ductwork.
5. Group B (Ambulatory Care Facilities, Clinics: Outpatient and Laboratories: Testing and Research Only), Group E (Educational) and Group I (Institutional) Occupancies.

C503.4.1 New mechanical systems. All new mechanical systems and equipment in existing buildings, ~~including packaged unitary equipment and packaged split systems,~~ shall comply with Sections C403 and C408.

C503.4.3 Alterations or replacement of existing cooling systems. Alterations to, or replacement of, existing mechanical cooling systems shall not decrease the building total economizer capacity unless the system complies with either Section C403.3.5 or C403.5. System alterations or replacement shall comply with Table C503.4.3 when the individual cooling unit capacity and the building total capacity of all cooling equipment without economizer do not comply with Sections C403.3.5 or C403.5. Equipment replacements that include space heating shall also comply with Section C503.4.6.

TABLE C503.4.3
ECONOMIZER COMPLIANCE OPTIONS FOR MECHANICAL ALTERATIONS

C503.4.4 Controls for cooling equipment replacement. When space cooling equipment is replaced, controls shall comply with all requirements under Section C403.3.5 and related subsections, and Section C403.5.1. for integrated economizer control.

C503.4.5 ~~Cooling~~ Mechanical equipment relocation. Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit

C503.4.6 Addition or replacement of heating appliances. Where a mechanical heating appliance is added or replaced, the added or replaced appliance shall comply with C403.1.4 or with an alternate compliance option in Table C503.4.6.

Exceptions:

1. Terminal unit equipment, including but not limited to, hydronic VAV boxes, electric resistance VAV boxes, electric duct heaters, water source heat pumps, fan coils, or VRF indoor units that are served by an unaltered central system.
2. Air handling equipment with hydronic coils.
3. Air handling equipment designed for 100% outdoor air that is not subject to the requirements in Section C403.3.5 or that qualifies for an exception to C403.3.5.
4. Replacement of existing oil-fired boilers.
5. Replacement of existing steam boilers with steam distribution to terminal units and the associated boiler feed equipment.
6. Where compliance with C403.1.4 would trigger an unplanned utility electrical service upgrade based upon the NEC 220.87 method for determining existing loads.
7. Like-for-like replacement of a single heating appliance is permitted where that appliance is failing, requires immediate replacement, and where no other HVAC work is planned.

**TABLE C503.4.6 COMPLIANCE OPTIONS FOR MECHANICAL HEATING
EQUIPMENT ALTERATIONS**

	<u>Proposed Heating Equipment Type^a</u>	<u>Heating Efficiency Table Reference</u>	<u>Alternate Compliance Options to Section C403.1.4</u>
1	<u>Air-Cooled Unitary Heat Pumps</u>	<u>Table C403.3.2(2)</u>	1) <u>Compliance with C403.1.4, except heat pump rated capacity in accordance with Section C403.1.4 exception 5d is permitted to be sized equal to the supplemental internal resistance heating capacity in Climate Zone 4 or 5.^c</u> 2) <u>Compliance with C403.1.4, except electric resistance mixed air preheat is permissible.^c</u>
2	<u>Packaged terminal, single-package vertical, and room air-conditioner heat pumps</u>	<u>Table C403.3.2(4)</u>	1) <u>Compliance with C403.1.4, except heat pump rated capacity in accordance with Section C403.1.4 Exception 5d is permitted to be sized equal to the supplemental internal resistance heating capacity in Climate Zone 4 or 5.</u>
3	<u>Furnaces, duct furnaces, and unit heaters</u>	<u>Table C403.3.2(5)</u>	1) <u>Efficiency: +10%^b</u>
4	<u>Gas-fired hot water boilers with fewer than 80% of coils replaced</u>	<u>Table C403.3.2(6)</u>	1) <u>Efficiency: +10%^b</u>
5	<u>Variable refrigerant flow air-to-air and applied heat pumps</u>	<u>Table C403.3.2(9)</u>	<u>No alternate compliance option</u>
6	<u>DX-DOAS equipment</u>	<u>Table C403.3.2(12) and Table C403.3.2(13)</u>	1) <u>DX-DOAS is provided with heat recovery if not required by C403.3.5.1.</u>
7	<u>Water-source heat pumps</u>	<u>Table C403.3.2(14)</u>	<u>No alternate compliance option</u>

- a. Includes replacement of equipment with a unit that is the same type and has the same or higher efficiency and the same or lower capacity, or replacement of one equipment type with a different equipment type.
- b. Equipment shall have a capacity-weighted average heating system efficiency that is 10 percent better than that shown in the reference table (1.10 x values in reference table).
- c. Option 1 and Option 2 can be combined.

C503.4.6.1 Hydronic system alteration supply water temperature. Hydronic heating coils and appliances subject to Section C503.4.6 shall comply with Section C403.3.7.2 [note to reviewer: to be coordinated with proposal number 21-GP1-52].

Exception: Replacement coils within an existing hot water heating system.