CEPI-78-21 as modified suggestion by J. Bade

# IECC®: C403.12.1

**Proponents:**

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**2021 International Energy Conservation Code**

**Add new definition:**

**C202 Fan cooling unit.** Equipment or the portion of equipment that includes a means of mechanically cooling air supplied to *conditioned spaces* where the air movement is caused by a difference in pressure produced by a fan. The heat rejection portion of packaged equipment is not included.

# Revise as follows:

C403.12.1 Duct, ~~Air Handlers~~ *fan cooling unit*, and plenum insulation and sealing.

Supply and return air ducts, ~~and~~ plenums, ~~rooftop units and air handlers~~ and *fan cooling units* shall be insulated with not less than R-6 insulation where located in unconditioned spaces and where located outside the building with not less than R-8 insulation in *Climate Zones* 0 through 4 and not less than R-12 insulation in *Climate Zones* 5 through 8. Ducts located underground beneath buildings shall be insulated as required in this section or have an equivalent *thermal distribution efficiency*. Underground ducts utilizing the *thermal distribution efficiency* method shall be *listed* and *labeled* to indicate the *R*-value equivalency. Where located within a building envelope assembly, the duct, plenum~~, rooftop units and/or air handlers~~ shall be separated from the building exterior or unconditioned or exempt spaces by not less than R-8 insulation in *Climate Zones* 0 through 4 and not less than R-12 insulation in *Climate Zones* 5 through 8.

Exceptions:

1. Where ducts are located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct, ~~or~~ plenum, or *fan cooling unit* is not greater than 15°F (8°C).
3. *Fan cooling units* located indoors with a design airflow of less than 5,000 cfm (2,400 L/s)
4. *Fan cooling units* with a cooling capacity less than 760,000 Btu/h (223 kW/h) included in Table C403.3.2(1) Electrically Operated Unitary Air Conditioners *and* Condensing Units—Minimum Efficiency Requirements
5. *Fan cooling units* with a cooling capacity less than 760,000 Btu/h (223 kW/h) included in Table C403.3.2(2) Electrically Operated Air-Cooled Unitary Heat Pumps—Minimum Efficiency Requirements
6. *Fan cooling units* with a cooling capacity less than 760,000 Btu/h (223 kW/h) included in Table C403.3.2(8) Electrically Operated Variable-Refrigerant-Flow Air Conditioners—Minimum Efficiency Requirements
7. *Fan cooling units* with a cooling capacity less than 760,000 Btu/h (223 kW/h) included in Table C403.3.2(9) Electrically Operated Variable-Refrigerant-Flow *and* Applied Heat Pumps—Minimum Efficiency Requirements
8. *Fan cooling units* with a cooling capacity less than 760,000 Btu/h (223 kW/h) included in Table C403.3.2(10) Floor-Mounted Air Conditioners *and* Condensing Units Serving Computer Rooms—Minimum Efficiency Requirements
9. *Fan cooling units* included in Table C403.3.2(12) Electrically Operated Dx-DOAS Units, Single-Package *and* Remote Condenser, Without Energy Recovery—Minimum Efficiency Requirements
10. *Fan cooling units*) included in Table C403.3.2(13) Electrically Operated Dx-DOAS Units, Single-Package *and* Remote Condenser, With Energy Recovery—Minimum Efficiency Requirements
11. *Fan cooling units* with a cooling capacity less than 760,000 Btu/h (223 kW/h) included in Table C403.3.2(14) Electrically Operated Water-Source Heat Pumps—Minimum Efficiency Requirements
12. *Fan cooling units* with a cooling capacity less than 760,000 Btu/h (223 kW/h) included in Table C403.3.2(16) Ceiling-Mounted Computer-Room Air Conditioners—Minimum Efficiency Requirements

Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the International Mechanical Code.

# Revise the following:

**C403.5 Economizers.**

Economizers shall comply with Sections C403.5.1 through C403.5.5.

An air or water economizer shall be provided for the following cooling systems:

1.Chilled water systems with a total cooling capacity, less cooling capacity provided with air economizers, as specified in Table C403.5(1).

2.Individual fan systems with cooling capacity greater than or equal to 54,000 Btu/h (15.8 kW) in buildings having other than a Group R occupancy,

The total supply capacity of all ~~fan cooling units~~ *fan cooling units* not provided with economizers shall not exceed 20 percent of the total supply capacity of all fan cooling units in the building or 300,000 Btu/h (88 kW), whichever is greater.

3.Individual fan systems with cooling capacity greater than or equal to 270,000 Btu/h (79.1 kW) in buildings having a Group R occupancy.

The total supply capacity of all ~~fan cooling units~~ *fan cooling units* not provided with economizers shall not exceed 20 percent of the total supply capacity of all fan cooling units in the building or 1,500,000 Btu/h (440 kW), whichever is greater.

# Reason Statement:

There is no code requirement for outdoor HVAC equipment in terms of R-value, or insulation requirement. This change is designed to have the outdoor HVAC equipment match the same R-value as the ductwork it is served by. As outdoor HVAC equipment typically has larger surface area, typically designed around 500 FPM, then the duct it is served by, typically around 1200FPM, there is a great opportunity to save energy by improving the R-value of the HVAC equipment casing

# Cost Impact:

The code change proposal will increase the cost of construction.

For many products there would be no change in cost, as R-13 is standard for many manufacturers of outdoor equipment. However, some manufacturer models types would require changes to meet this requirement with a potential increase in cost.

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**2021 PUBLIC INPUT TO THE 2021 IECC, IRC CH. 11, AND ICCPC CH. 15 CE233**