

Delaware Energy Code Update – Commercial



As of December 11, 2020, all permit applications for new buildings, additions, and alterations must meet the provisions of the 2018 International Energy Conservation Code (IECC) or ASHRAE 90.1-2016. The table below provides an overview of the changes between the 2012 and 2018 IECC.

2018 Section	Topic	Changes
Building Envelope Requirements		
Table C402.1.4	Opaque Thermal Envelope, U-factor Method	<ul style="list-style-type: none"> Insulation entirely above deck increased to U-0.032 Slab-on-grade floors - Heated slabs increased to F-0.86 plus F-0.64 full slab insulation Opaque doors are now included in this table
Table C402.1.4	Opaque Thermal Envelope, R-value Method	<ul style="list-style-type: none"> Insulation entirely above deck increased to R-30ci Slab-on-grade floors - Heated slabs increased to R-15 plus R-5 full slab insulation Opaque doors now only show Nonswinging in this table
C402.2.1	Roof assembly	Additional details on exceptions relating to tapered insulation
C402.2.3	Floors	Two exceptions added regarding floors over outdoor air or unconditioned space.
C402.2.6	Insulation of radiant heating systems	Exception added regarding heat slabs on grade.
C402.2.7	Airspaces	New section that requires enclosing air spaces if they are included as part of thermal envelope insulation calculations or modeling.
C402.4	Fenestration	SHGC requirements now vary based on projection factor and orientation.
Table C402.5.2	Maximum air infiltration rate	Additional fenestration assemblies added to table.
C402.5.3 (NEW)	Rooms containing fuel-burning appliances	New section detailing requirements for rooms containing fuel-burning appliances.
C402.5.7	Vestibules	Exception added for when vestibules are not required
Building Mechanical Systems		
C403.2.1 (NEW)	Zone Isolation	Section added regarding zone isolation for zones greater than 25,000 sqft

Building Mechanical Systems Continued

Table C403.3.2	Minimum efficiency requirements	Minimum efficiency requirements have been increased for majority of equipment types.
C403.3.2.1	Water-cooled centrifugal chilling packages	Equations for maximum full-load kW/ton rating and maximum NPLV rating have been updated.
C403.3.4 (NEW)	Boiler turndown	Section added regarding minimum turndown ratio for boilers.
C403.4	Heating and cooling system controls	Control requirements for thermostatic controls, off-hour controls, hydronic system controls, part-load controls, and pump isolation have been consolidated into this section, with expansions of language, requirements, and exceptions.
C403.5	Economizers	Expands language on what cooling systems an economizer shall be provided for, as well as a reorganization of text regarding exceptions. Requirements of both simple and complex systems have been consolidated to this section (previously separated in 2012 IECC). C403.5.3 details new requirements for air economizers while C403.5.4 details new requirements for water-side economizers.
Table C403.5(1)	Economizer Requirements	<p>Table has been expanded to provide distinction of economizer requirement based on total chilled-water system capacity between local water-cooled chilled-water systems (720,000 Btu/h) and air-cooled chilled-water systems or district chilled-water systems (940,000 Btu/h).</p> <p>Economizer exception for climate zone 4A requires 20% cooling equipment performance improvement.</p>
C403.5.1	Integrated Economizer Control	Introduces a new staged cooling requirement for DX units. According to item 2 under Section C403.5.1, for DX units that control 75,000 Btu/h or greater of rated capacity directly based on occupied space temperature (usually serving a single zone), a minimum of two stages of mechanical cooling capacity are required. Another related new code requirement in Table C403.8.5.1 requires a two-stage fan control for DX units with cooling capacity over 65,000 Btu/h. In practice, a DX unit would either have both staged cooling and staged fan controls together or neither of them.
C403.5.5 (NEW)	Economizer fault detection	Introduces new mandatory requirement of economizer fault detection and diagnostics.
C403.6	Multiple zones	Expands on section regarding requirements for mechanical systems serving multiple zones with new requirements for multizone VAV system ventilation optimization control, parallel-flow fan-powered VAV air terminal control, setpoints for DDC, and static pressure sensor location.
C403.7	Ventilation and exhaust systems	Introduces new mandatory requirements for demand control ventilation, enclosed parking garage ventilation controls, ventilation air heating control, and energy recovery ventilation systems.

Building Mechanical Systems Continued

C403.7.4	Energy recovery ventilation systems	Specifies the energy recovery ventilator (ERV) requirements by climate zone for different outdoor air fraction and design supply fan size thresholds. These requirements are for systems with outdoor air fractions above 30%. The changes from the 2012 to 2018 IECC, in Table C403.7.4(1) in Section C403.7.4, reduced the fraction threshold to 10% in climate zone 4A. The table was also split into two tables: one for systems operating < 8,000 hours per year and one for systems operating ≥ 8,000 hours per year.
C403.7.5 (NEW)	Kitchen exhaust systems	Introduces requirements for all kitchen exhaust systems.
C403.7.6 (NEW)	HVAC systems serving guestrooms	Introduces requirements for automatic setpoint and ventilation control requirements for Group R-1 buildings containing more than 50 guestrooms.
C403.7.7	Shutoff dampers	Section has been expanded and now includes a maximum air leakage rate.
Table C403.8.1(2)	Fan power limitation	Adds new deductions to the Fan Power Limitation Drop Adjustment table. With this code change, systems without a central cooling coil are required to deduct 0.6 in. w.c. from their fan power limits. Systems without a central heating coil are required to deduct 0.3 in. w.c. Finally, systems with a central electric resistance heating element are required to deduct 0.2 in. w.c.
C403.8.3 (NEW)	Fan efficiency	Introduces new requirement for fans to have a fan efficiency grade (FEG) of not less than 67.
C403.8.4 (NEW)	Fractional hp fan motors	Requires motors from 1/12 horsepower (hp) to under 1 hp to be EC motors or have a minimum efficiency of 70%. The intention is to replace standard permanent-split capacitor (PSC) motors having efficiencies in the range of 15% to 65% with more efficient EC motors. The intended applications are toilet exhaust fans, small kitchen exhaust fans, series fan-powered VAV boxes, and fan-coil units. The following motors are exempt under the new requirement: motors in an airstream where only heating is provided, motors in packaged equipment, poly-phase small motors, and capacitor-start capacitor-run and capacitor-start induction-run motors that are covered by Table C405.7(3) and Table C405.7(4) in the 2018 IECC.
C403.10 (NEW)	Refrigeration equipment performance	Adds control requirements for walk-in coolers and freezers, and refrigerated warehouse coolers and freezers. The requirements are for cover doors, insulation, evaporator fan motor, lighting, anti-sweat heater, condenser fan motor, and their controls. The section also covers new performance requirements for refrigeration equipment reflect changes to national manufacturing standards (10 Code of Federal Regulations (CFR) part 431) which went into effect on January 1, 2020.

Service Water Heating

Table C402.2	Minimum performance of water-heating equipment	Updated to current federal water heater efficiencies
C404.2.1 (NEW)	High input service water-heating systems	New requirement for water-heating equipment which serves the entire building with an input rating of 1,000,000 Btu/h (293 kW).
C404.5 (NEW)	Heated water supply piping	Introduces new requirements for maximum allowable pipe length or pipe volume method.
C404.6 (NEW)	Service water maintenance	Introduces new requirements for heated water circulating and temperature maintenance systems.
C404.7	Demand recirculation controls	Introduces new requirements for demand recirculation controls.

Electrical Power and Lighting Systems

C405.2	Lighting Controls	This section is greatly expanded upon from the 2012 IECC. Adds Luminaire level lighting controls (LLLC) option for compliance with lighting controls requirements.
C405.2.1	Occupant sensors	Extends the occupancy sensor control requirements to copy/print rooms, lounges, locker rooms, open plan office areas, and warehouses. Also reduces time-to-off from 30 minutes to 20 minutes from when last occupied. Adds additional requirements to control functions for warehouses and open plan office areas.
C405.2.3	Daylight-responsive controls	Requires automatic daylight responsive controls for sidelight daylight area as opposed to manual controls (an allowed option in the 2012). Specifies 150 Watts of general lighting within sidelight daylight zone as the minimum threshold to apply the control requirement and include exceptions for some building and space types. Also specifies control settings.
C405.2.3.1	Daylight-responsive controls	Specifies continuously dimming controls from full light output to 15% or lower for offices, classrooms, laboratories, and library reading rooms.
C405.2.4	Specific application controls	For hotel and motel sleeping units and guest suites, the requirement changed from manual control to automatically switching off all installed luminaires and switched receptacles within 20 minutes after all occupants leave the room.
C405.2.6	Exterior lighting controls	Requires exterior façade and landscape lighting to be automatically turned off as a function of dawn/dusk and a set business opening and closing time. Exterior lighting not specified as façade or landscape lighting is to be automatically reduced by 30% of its peak power from between no later than midnight to 6 a.m., or from 1 hour after business closing to 1 hour before business opening, or during any period when activity has not been detected for a time longer than 15 minutes.

Electrical Power and Lighting Systems Continued

C405.3.1	Total connected interior lighting power	Added additional equipment that is excluded when calculating total connected lighting power.
C405.3.2	Interior lighting power allowance	Replaces the lighting power density table with a new table containing lower LPDs for most building area types in Table C405.3.2(1) Building Area Method and Table C405.3.2(2) Space-by-Space Method.
C405.4.1	Total connected exterior lighting power	Expands applications that are excluded from calculating total connected exterior power.
Table C405.4.2(2)	Lighting power allowances for building exteriors	Decreases power allowances across all categories in all lighting zones.
C405.6 (NEW)	Electrical transformers	Introduces minimum efficiency requirements and exceptions for low-voltage dry-type distribution electric transformers.
C405.7 (NEW)	Electric motors	Introduces minimum efficiency requirements for electric motors
C405.8 (NEW)	Transportation systems	Introduces requirements for elevators, escalators, and moving walks.

Additional Efficiency Packages

C406.1	Efficiency packages	Expands on the number of package options from three to eight, adding compliance options for enhanced lighting controls, outdoor air systems, service water heating, envelope performance, and air infiltration.
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Total Building Performance

C407.2	Mandatory requirements	Expands on sections which require compliance to Sections C402.5, C403.2, C403.3 through C403.3.2, C403.4 through C403.4.2.3, C403.5.5, C403.7, C403.8.1 through C403.8.4, C403.10.1 through C403.10.3, C403.11, C403.12, C404, and C405.
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Total Building Performance

C407.3	Performance-based compliance	Adds requirement that reduction in energy cost of the proposed design associated with on-site renewable energy shall not be more than 5% of the total energy cost.
C407.4.2	Additional documentation	Adds requirements for documentation on the reduction of energy use associated with on-site renewable energy.
C407.6.3 (NEW)	Exceptional calculation methods	Introduces option to use an exceptional calculation method whenever the simulation program does not model a design, material, or device of the proposed design.

Maintenance Information and System Commissioning

C408.2.4	Preliminary commissioning report	Adds two items to be identified in the preliminary commissioning report, results of functional performances tests, and functional performance test procedures.
C408.3	Functional testing of lighting controls	Expands on section for functional testing procedures for occupant sensor controls, time-switch controls, and daylight responsive controls.