

Delaware Energy Code Update – Commercial (ASHRAE 90.1)



The Delaware Department of Natural Resources and Environmental Control (DNREC) is in the process of evaluating the 2021 International Energy Conservation Code (IECC), with reference to ASHRAE 90.1-2019, for possible adoption in 2023. To assist construction and code enforcement stakeholders, this guide provides an overview of significant changes between ASHRAE 90.1-2016 and 2019.

ASHRAE 90.1-2019 Section	Topic	Changes
Administration and Enforcement		
4.2.5	Verification, Testing, and Commissioning	Section expanded to reference commissioning requirements in other sections of the standard and include “verification or functional performance testing (FPT)” instead of “verification” only.
Building Envelope – Climate Zone 4		
5.4.3	Air Leakage Testing	Pressurization testing is now required for all commercial buildings with a leakage limit of 0.40 cfm/sqft envelope area. Up to 0.60 cfm/sqft is allowed if diagnostics and remedial air sealing are performed.
Table 5.5-4	Fenestration U-factors and Solar Heat Gain Coefficients	<p>The fenestration U-factor and SHGC table was modified to replace the categories “metal framing” and “nonmetal framing” with “fixed” and “operable” resulting in the following U-factor changes.</p> <p>Fixed, nonmetal framing: U-0.31 to U-0.36 Fixed, metal framing: U-0.38 to U-0.36 Operable, nonmetal framing: U-0.31 to U-0.45 Operable, nonmetal framing: U-0.46 to U-0.45 Entrance door vertical fenestration: U-0.68 to U-0.63</p>
Exceptions to 5.4.3.3	Vestibules and Revolving Doors	Revolving doors were added as an option to maintain an air barrier at building entrances instead of being listed as an exception. New exceptions to vestibules added for semiheated spaces and enclosed elevator lobbies for building entrances directly from parking garages.
Mechanical Systems		
Table 6.4.1.3	Ceiling Fans	New section adds data reporting requirements for large-diameter ceiling fans including blade span, rated airflow, and power consumption at the max speed.

ASHRAE 90.1-2019 Section	Topic	Changes
Mechanical Systems - Continued		
6.4.5	Vacuum Insulating Glazing for Reach-in and Walk-in Coolers	Vacuum insulating glazing was added as an option to meet the requirement for transparent doors and windows in addition to the preexisting requirement to have triple-pane glass with inert gas fill or heat-reflective treatment.
Table 6.5.3.1.2	Fan Motor Selection	Exceptions added to allow for design flexibility to use fans that vary the flow as a function of the load.
6.5.3.1.3	Fans and Fan Systems	Fan Efficiency Grade (FEG) efficiency metric replaced with Fan Energy Index (FEI). The minimum FEI is 1.00 for constant volume fans and fan arrays and 0.95 for variable-air volume fans and fan arrays.
6.5.6.1.1	Energy Recovery for Nontransient Dwelling Units	Exhaust air energy recovery is now required for nontransient dwelling units with a minimum enthalpy recovery ration at heating design condition of at least 60%.
Table 6.5.6.3	Condenser Heat Recovery	New section requiring condenser heat recovery for space conditioning in acute inpatient care facilities meeting certain load criteria.
6.6	Computer Rooms	Computer rooms that have an IT equipment load larger than 10 kW may now comply with either the ASHRAE 90.1 Prescriptive Path (Section 6.5) or the Alternative Compliance path in Section 6.6, which requires adherence to ASHRAE 90.4 Energy Standard for Data Centers.
6.8.1	Minimum Equipment Efficiency Tables	The number of tables increased from 16 to 20, including the addition of new tables for water-source heat pumps, heat pump and heat recovery chiller packages, and splitting air conditioners and condensing units serving computer rooms into floor-mounted versus ceiling-mounted. Tables were also added for walk-in cooler and freezer display doors and nondisplay doors, and walk-in cooler and freezer refrigeration systems. The liquid-to-liquid heat exchangers table was deleted.
Lighting		
9.3	Simplified Lighting Method	New section added to create a simplified approach for buildings up to 25,000 sqft with at least 80% of floor area used as office, retail, or school spaces. Table 9.2.3.1 lists 18 specific applications as exempt from lighting power and control requirements. Table 9.3.1-1 through 9.3.1-3 list lighting power allowance and control requirements independently for office, retail, and school buildings.
9.4.1.1	Daylight Responsive Controls	Continuous dimming is required for all spaces. Stepped dimming is no longer allowed.

ASHRAE 90.1-2019 Section	Topic	Changes
Lighting - Continued		
Chapter 3 and 9.4.1.1	Daylight Responsive Controls	The definition of a primary sidelighted area was updated to clarify that the depth of the daylight zone is measured horizontally from the window. The exception to daylight responsive controls for sidelighted areas shaded by adjacent structures was amended to also include natural objects.
9.4.1.2	Parking Garage Lighting Control	Parking garage luminaire power reduction increased from 30% to 50% and the time of no activity triggering the reduced power was decreased from 20 minutes to 10 minutes.
9.5 and 9.6	Lighting Power Allowances	The lighting power densities used to calculate lighting power allowances have been revised to reflect an improved ASHRAE 90.1 lighting model and a 100% LED baseline.
Other Equipment		
Chapter 3	Pump Definitions	New definitions for pumps including pump, clean-water pump, end-suction close-coupled (ESCC) pump, and submersible turbine (ST) pump.
10.4.7	Pumps	Clean water pumps meeting certain criteria must meet the maximum pump energy index (PEI) specified in Table 10.8-6.
Energy Cost Budget Method		
11	Energy Cost Budget Method	This optional compliance path contains numerous changes to maintain consistency with other code updates.
11.4.3.1	Renewable Energy System Modeling Rules	The rules relating to treatment of renewable energy systems were clarified.
11.4.3.2	On-Site Electricity Generation Systems	Where the baseline design includes on-site electricity generation systems other than on-site renewable energy systems, the baseline design must now include the same generation systems excluding its site-recovered energy.
Table 11.5.1	Lighting Modeling Rules	The rules for lighting modeling were updated extensively.
Performance Rating Method (Appendix G)		
G3.1.2.1	Baseline Requirements for Combining Thermal Zones	Baseline efficiency requirements were clarified for when multiple thermal zones are combined into a single thermal block.
G3.1.2.1	Heating and Cooling COPs in the Baseline Design	Explicit heating and cooling COPs were provided without fan for the baseline packaged cooling equipment.

ASHRAE 90.1-2019 Section	Topic	Changes
Performance Rating Method (Appendix G) - Continued		
G3.1.2.2	System Coil Capacities in the Baseline Design	Clarification was added for how plant and coil sizing should be performed.
Table G3.1, No. 12	Automatic Receptacle Controls	Rules were added for modeling the impact of automatic receptacle controls.
G3.1.1.4	Infiltration Modeling	More specific baseline rules were set for infiltration modeling
G2.4.1	On-Site Renewable Energy and Site-Recovered Energy	The rules relating to treatment of renewable energy systems were clarified.
Table G3.1, No.	Lighting Modeling Rules	The rules for lighting modeling were updated extensively.