

Highlights of 90.1-2013 Changes from 90.1-2010

This document highlights most of the changes between 90.1-2010 and 90.1-2013 but is not a complete list. Please refer to the Standard or to the BECP 90.1-2013 training materials for specific details of the changes.

ENVELOPE

- Changes references from clerestory to roof monitor (*Chapter 5*)
- Adds low-e requirements for storm window retrofits (*5.1.3*)
- Clarifies roof insulation requirements, differentiating between roof recovering (on top of existing roof covering) and replacement of roof covering (*5.1.3*)
- Relaxes air leakage requirements for high-speed doors for vehicle access and material transport (*5.4.3.2*)
- Adds specific vestibule requirements for large spaces (*5.4.3.4*)
- Requires roof solar reflectance and thermal emittance testing to be in accordance with CRRC-1 Standard (*5.5.3.1*)
- Reduces the area threshold at which skylights and daylighting controls are required (*5.5.4.2.2*)
- Terms - Modifies daylighting definitions

HVAC

- Equipment Efficiencies
 - Added commercial refrigerators, freezers, and refrigeration equipment
 - Modified minimum efficiency standards for water-to-air heat pumps (water loop, ground water, and ground loop). Proposed cooling EERs and heating COPs are more stringent.
 - Increased minimum efficiency standards for single-package vertical air conditioners and single-package vertical heat pumps
 - Modified minimum efficiency requirements for evaporatively cooled air conditioners greater than or equal to 240,000 Btu/h and less than 760,000 Btu/h and heating type-other
 - Increases the minimum efficiency of open circuit axial fan cooling towers and adds a requirement for all types of cooling towers (minimum efficiency requirements apply to the tower including the capacity effect of accessories which affect thermal performance)

- Increases SEER and HSPF for air-cooled three-phase commercial air conditioners and heat pumps below 65,000 Btu/h (effective 1/1/2015)
- Increases cooling efficiency for PTACs
- Adds efficiency requirements for evaporative condensers with ammonia refrigerants
- Increases air- and water-cooled chiller efficiencies and exempts water-cooled positive displacement chillers with leaving condenser temperature $\geq 115^{\circ}\text{F}$
- Increases IEER requirements for air-cooled air conditioners and heat pumps and EER requirements for water and evaporatively cooled air conditioners and heat pumps
- Re-establishes product class for SDHV air conditioners and heat pumps and adds efficiency requirements at $<65,000$ Btu/h below level of current federal standards
- Increases boiler efficiency for residential sized (NAECA covered) equipment, $<3,000$ Btu/h
- Changes optimum start requirement from $> 10,000$ cfm to any DDC system and adds a requirement that outside air temperature be used in optimum algorithms (6.4.3.3)
- Establishes limits on using electric or fossil fuel to humidify or dehumidify between 30% and 60% RH except certain applications and requires deadband on humidity controls (6.4.3.6)
- Reduces occupancy threshold for demand controlled ventilation from greater than 40 people per 1000 ft² to equal to or greater than 25 people per 1000 ft² with exemptions for certain occupancies (6.4.3.8)
- Reduces the system size and outdoor air thresholds at which energy recovery is required
- Adds control requirements for heating systems in vestibules (6.4.3.9)
- Eliminates contingency on DDC system existence for setpoint overlap restrictions, humidification and dehumidification controls, VAV fan control setpoint reset, multiple-zone VAV system ventilation optimization control, hydronic system differential pressure reset by valve position. Instead, it specifies for what system types or sizes DDC is required and minimal functional requirements for DDC systems. (6.4.3.10)
- Adds mandatory and prescriptive requirements for walk-in coolers and freezers and refrigerated display cases (6.4.5 and 6.4.6)
- Revises high limit shutoff for air economizers (6.5.1.1.3) and adds sensor accuracy requirements (6.5.1.1.6)
- Relaxes design requirements for waterside economizers for computer rooms (6.5.1.2.1)

- Requires humidifiers mounted in the airstream to have an automatic control valve shutting off preheat when humidification is not required, and insulation on the humidification system dispersion tube surface (6.5.2.4)
- Added new definition (FEG = Fan Efficiency Grade) and requires each fan has an FEG of 67 or higher as defined by AMCA 205-10 (6.5.3.1.3)
- Modified requirement for static pressure sensor location and control requirements for setpoint reset for systems with DDC of individual zones (6.5.3.2.2)
- Requires fractional horsepower motors $\geq 1/12$ hp to be electronically-commutated motors or have a minimum 70% efficiency in accordance with 10 CFR 4321 and requires adjustable speed or other method to balance airflow (6.5.3.5)
- Establishes minimum turndown for boilers and boiler plants with design input power of at least 1,000,000 Btu/h (6.5.4.1)
- Expands the requirements for fan speed control for both chilled water and unitary direct expansion systems and enhances the requirements for integrated economizer control and defines DX unit capacity staging requirements (6.5.4.3)
- Addresses fan power limitation pressure drop adjustment credits and adds deductions from allowed fan power for systems without any central heating or cooling as well as systems with electric resistance heating. (6.5.3.1) Sound attenuation credit is modified to be available only when there are background noise criteria requirements.
- Establishes chiller and boiler fluid flow isolation requirements so there is no flow through the equipment when not in use (6.5.4.3)
- Revises night setback requirements and removes exceptions for climate zones
- Requires VAV dual maximum damper position when DDC system is present and clarifies dual maximum sequence
- Deletes sizing requirements for pipes >24 inches in diameter
- Modified heat rejection equipment (cooling tower) requirements to require that VSD controlled fans operate all fans at the same speed instead of sequencing them, and that open-circuit towers with multiple cells operate all cells in parallel down to 50% of design flow (6.5.5.4)
- Reduces design supply fan air flow rate for which energy recovery is required for systems that operate more than 8000 hours per year (6.5.6.1)
- Reduces the limits on hot gas bypass as a means of cooling capacity control (6.5.9)

- Adds requirements for door switches to disable or reset mechanical heating or cooling when doors without automatic door closers are left open (6.5.10)
- Added power usage effectiveness (PUE) as an alternative compliance methodology for data centers (6.6.1)

POWER AND LIGHTING

- Increases the spaces where plug shutoff control is required. Clarifies the application of this requirement for furniture systems, lowers the threshold for turn off from 30 to 20 minutes, states a labeling requirement to distinguish controlled and uncontrolled receptacles and restricts the use of plug-in devices to comply with this requirement (8.4.2)
- Specifies requirements for installation of basic electrical metering of major end uses to provide basic reporting of energy consumption data to building occupant (8.4.3)
- Nominal efficiencies established in accordance with 10 CFR 431 test procedure for low-voltage dry-type transformers (8.4.4)
- Adds control requirements for lighting alterations for interior and exterior applications (9.1.2)
- Eliminates the exception for wattage used in spaces where lighting is specifically designed for those with age-related eye conditions or other medical conditions related to the eye, where special lighting or light levels might be needed (9.2.2.3)
- Changes the criterion for applying automatic daylighting control for sidelighting and toplighting to a controlled lighting power basis and provides characteristics for the required photo controls (9.4.1.1)
- Adds control requirements for secondary sidelighting areas (9.4.1.1)
- Requires the use of certain lighting controls in more space types (9.4.1.1)
- Reduces the amount of time after occupants vacate a space for lights to be automatically reduced or shut off (9.4.1.1)
- Modifies requirements for automatic lighting control for guestroom type spaces. Exceptions to this requirement are lighting and switched receptacles controlled by captive key systems. (9.4.1.3)
- Includes loading docks as a tradable surface (Table 9.4.2.2)
- Adds more specific requirements for the functional testing of lighting controls, specifically occupancy sensors, automatic time switches and daylight controls (9.4.3)

- Updates LPDs in Table 9.5.1 – Building Area Method and Table 9.6.1 – Space-by-Space (*Tables 9.5.1 and 9.6.1*)
- Modifies Table 9.6.2 to include continuous dimming in secondary sidelighted areas, which is now based on an installed wattage rather than area of the space. Eliminates the need for effective aperture calculation. (*Table 9.6.2*)
- Adds a section for submittals (*9.7*)
- *Terms* - Deletes the term clerestory and adds roof monitor and clarifies the definition and changes references from clerestory to roof monitor. Revises several definitions related to daylighting.