

Tim:

Attached comment based on my review of the 2012 WS Amendment Code Comments with explanation in *green text* and changes in red underline:

2012 IBC/IFC:

Change below is required to for CO detectors to be required in sleeping units.

[F] 908.7 Carbon monoxide alarms. Group I or Group R occupancies shall be provided with single station carbon monoxide alarms installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units or sleeping units and on each level of the dwelling. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720-2009 and the manufacturer's instructions.

2012 IMC:

Change below is required to correlate with exception to section 403.8.5.1 for intermittent operation.

403.8.2 Control and operation.

5.5 The intermittent mechanical ventilation system shall operate at least one hour out of every ~~twelve~~ four.

2012 IECC:

Item 2 should require compliance with Commissioning and Energy Metering sections to be consistent with 2009 WSEC stringency.

C401.2 Application. Commercial buildings shall comply with one of the following:

1. The requirements of Sections C402, C403, C404, C405, C408 and C409. In addition, commercial buildings shall comply with either Section C406.2, C406.3, C406.4, or C406.5.
2. The requirements of Section C407, C408, C402.4, C403.2, C404, C405.2, C405.3, C405.4, C405.6 ~~and~~ C405.7, C408, and C409. The building energy consumption shall be equal to or less than 90 percent of the standard reference design building.

Recommend modifying air barrier compliance section to require field testing to be consistent with 2009 WSEC stringency.

C402.4.1.2 Air barrier compliance options. A continuous air barrier for the opaque building envelope shall comply with Section C402.4.1.2.1 or C402.4.1.2.2, ~~or C402.4.1.2.3~~. Buildings shall be field tested in accordance with C402.4.1.2.3.

Recommend modifying footnote d of Table C402.1.2 of Option 2 so that code language is enforceable.

d Exception: Integral insulated concrete block walls complying with ASTM C90 with all cores filled and meeting both of the following:

- 1 At least 50 percent of cores must be filled with vermiculite or equivalent fill insulation; and
- 2 ~~The structure encloses one of the following uses~~ The exterior envelope encloses one or more of the following uses: Warehouse (storage and retail), gymnasium, auditorium, church chapel, arena, kennel, manufacturing plant, indoor swimming pool, pump station, water and waste water treatment facility, storage facility, storage area, motor vehicle service facility. Where additional uses not listed (such as office, retail, etc.) are contained within the building the exterior walls that enclose these areas may not utilize this exception and must comply with the appropriate mass wall u-factor from Table 402.1.2.

PEX piping is often used as the final Domestic Hot Water (DHW) piping supply line to a plumbing fixture. It is common practice to route this piping in a protective tubing in the structural slab. This piping and

protective tubing has better insulating properties than metal piping but does not meet the minimum insulation requirements of C404.6. Exception is intended clarify that if this section of pipe is downstream of the recirculation piping then it is not required to be insulated.

C404.6 Pipe insulation. For automatic-circulating hot water and heat-traced systems, piping shall be insulated with not less than 1 inch (25 mm) of insulation having a conductivity not exceeding 0.27 Btu per inch/h \times ft² \times °F (1.53 W per 25 mm/m² \times K). The first 8 feet (2438 mm) of piping in non-hot-water-supply temperature maintenance systems served by equipment without integral heat traps shall be insulated with 0.5 inch (12.7 mm) of material having a conductivity not exceeding 0.27 Btu per inch/h \times ft² \times °F (1.53 W per 25 mm/m² \times K).

Exceptions: 1. Heat-traced piping systems shall meet the insulation thickness requirements per the manufacturer's installation instructions. Untraced piping within a heat traced system shall be insulated with not less than 1 inch (25 mm) of insulation having a conductivity not exceeding 0.27 Btu per inch/h \times ft² \times °F (1.53 W per 25 mm/m² \times K).

2: Domestic hot piping that is part of the final pipe run to the plumbing fixture and is not part of the automatic-circulating hot water recirculation path (downstream of distribution manifold) is not required to meet the minimum insulation requirements of C404.6.

Typo as line below Exception 4 should say "Notes for Exception 4".

C403.4.1 Economizers. Air economizers shall be provided on all new systems including those serving computer server rooms, electronic equipment, radio equipment, and telephone switchgear.

Economizers shall comply with Sections C403.4.1.1 through C403.4.1.4.

EXCEPTIONS: 1. Water-cooled refrigeration equipment serving chilled beams and chilled ceiling space cooling systems only which are provided with a water economizer meeting the requirements of Section C403.4.1. Water economizer capacity per building shall not exceed 500 tons. This exception shall not be used for Total Building Performance.

2. Systems complying with all of the following criteria:

2.1. Consist of multiple water source heat pumps connected to a common water loop;

2.2. Have a minimum of 60 percent air economizer;

2.3. Have water source heat pumps with an EER at least 15 percent higher for cooling and a COP at least 15 percent higher for heating than that specified in Section C403.2.3;

2.4. Where provided, have a central boiler or furnace efficiency of 90 percent minimum for units up to 199,000 Btu/h; and

2.5. Provide heat recovery with a minimum 50 percent heat recovery effectiveness as defined in Section C403.2.6 to preheat the outside air supply.

3. For Group R occupancies, cooling units installed outdoors or in a mechanical room adjacent to outdoors with a total cooling capacity less than 20,000 Btu/h and other cooling units with a total cooling capacity less than 54,000 Btu/h provided that these are high-efficiency cooling equipment with SEER and EER values more than 15 percent higher than minimum efficiencies listed in Tables C403.2.3 (1) through (3), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. For split systems, compliance is based on the cooling capacity of individual fan coil units.

4. Equipment used to cool any dedicated server room, electronic equipment room or telecom switch room provided that they completely comply with Option a, b, or c in the table below. The total capacity of all systems without economizers shall not exceed 240,000 Btu/h per building or 10 percent of its air economizer capacity, whichever is greater. This exception shall not be used for Total Building Performance.

	Equipment Type	Higher Equipment Efficiency	Part-Load Control	Economizer
Option a	Tables C403.2.3(1) and C403.2.3(2) ^a	+15% ^b	Required over 85,000 Btu/h ^c	None Required
Option b	Tables C403.2.3(1) and C403.2.3(2) ^a	+5% ^d	Required over 85,000 Btu/h ^c	Waterside Economizer
Option c	ASHRAE Standard 127 ^e	+0% ^f	Required over 85,000 Btu/h ^c	Waterside Economizer

Notes for Exception 5.4:

aFor a system where all of the cooling equipment is subject to the AHRI standards listed in Tables C403.2.3(1) and C403.2.3(2), the system shall comply with all of the following (note that if the system contains any cooling equipment that exceeds the capacity limits in Table C403.2.3(1) or C403.2.3(2), or if the system contains any cooling equipment that is not included in Table C403.2.3(1) or C403.2.3(2), then the system is not allowed to use this option).

bThe cooling equipment shall have an EER value and an IPLV value that is a minimum of 15 percent greater than the value listed in Tables C403.2.3(1) and C403.2.3(2) (1.15 x values in Tables C403.2.3(1) and C403.2.3(2)).

cFor units with a total cooling capacity over 85,000 Btu/h, the system shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50 percent of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g., minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).

dThe cooling equipment shall have an EER value and an IPLV value that is a minimum of 5 percent greater than the value listed in Tables C403.2.3(1) and C403.2.3(2) (1.05 x values in Tables C403.2.3(1) and C403.2.3(2)).

eThe system shall include a water economizer in lieu of air economizer. Water economizers shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 50°F dry-bulb/45°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures. The equipment shall be served by a dedicated condenser water system unless a nondedicated condenser water system exists that can provide appropriate water temperatures during hours when waterside economizer cooling is available.

fFor a system where all cooling equipment is subject to ASHRAE Standard 127-2007.

gThe cooling equipment subject to the ASHRAE Standard 127-2007 shall have an EER value and an IPLV value that is equal or greater than the value listed in Tables C403.2.3(1) and C403.2.3(2) when determined in accordance with the rating conditions ASHRAE Standard 127-2007 (i.e., not the rating conditions in AHRI Standard 210/240 or 340/360). This information shall be provided by an independent third party.

Modification for definition of the Daylight Zone for Code Proposal 11-026 was not included in final draft.
DAYLIGHT ZONE. (See also Fig. C202.4)

1. Under skylights. The area under skylights whose horizontal dimension, in each direction, is equal to the skylight dimension in that direction plus either 70 percent of the floor-to-ceiling height or the dimension to a ceiling height opaque partition, or one-half the distance to adjacent skylights or vertical fenestration, whichever is least.

2. Adjacent to vertical fenestration. The area adjacent to vertical fenestration which receives daylight through the fenestration. For purposes of this definition and unless more detailed analysis is provided, the primary daylight zone depth is assumed to extend into the space a distance equal to the window

head height and the secondary daylighted zone extends from the edge of the primary zone to a distance equal to two times the window head height or to the nearest ceiling height opaque partition, whichever is less. The daylight zone width is assumed to be the width of the window plus 2 feet (610 mm) on each side, or the window width plus the distance to an opaque partition, or the window width plus one-half the distance to adjacent skylight or vertical fenestration, whichever is least.

3. In parking garages. The area within 20 feet of any portion of a perimeter wall that has a net opening to wall ratio of at least 40 percent and no exterior obstructions within 20 feet.

4. Under Atrium glazing: The area at the floor directly beneath the atrium and the top floor under the atrium whose horizontal dimension, in each direction, is equal to the distance between the floor and ceiling height. Levels below the top floor that are not directly beneath the atrium are unaffected.

Footnotes for Table A103.3.7 of Appendix A per code proposal 11-006 were not included in final draft.

Notes for Default Table A103.3.7.2 of Appendix A

1. Exterior insulation values listed above are continuous r-values on the exterior side of the concrete floor.
2. For conditions with an exterior wall above the peripheral edge of intermediate concrete floor but with no wall below the intermediate concrete floor this table may be used as long as the code minimum insulation is applied to the floor slab below the concrete floor.
3. Typical conditions where conditioned space building envelope wall thermal insulation values are broken concrete floors include, but are not limited to, the following examples:
 - a. Elevator hoistway shafts that serve the conditioned building and pass through unconditioned floors such as parking garage levels.
 - b. Stairwell enclosures that serve the conditioned building and pass through unconditioned floors such as parking garage levels.
 - c. Walls between interior and exterior building envelope that separate the interior conditioned space from an exterior courtyard or roofdeck.
 - d. Walls between interior and exterior building envelope that separate the interior conditioned space from an exterior unconditioned space on parking garage levels.

Let me know if you have questions or comments,

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