**Florida Building Code, Energy Conservation**

**Chapter 4 [CE] COMMERCIAL ENERGY EFFICIENCY**

**SECTION C401**

**GENERAL**

C401.1 Scope. The provisions in this chapter are applicable to commercial

*buildings* and their *building sites.*

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

C401.2.1 Commissioning. Commercial buildings and tenant spaces shall

comply with Section C408 as applicable.

C401.2.~~1~~.2 Application to replacement fenestration products.

(EN-CE-Ch.4- Comment #11)

***[This Comment is intended to replace the current language in sections: C402.1, C403.2.14, C403.2.15, C403.2.16, C403.2.17 of the FL code. It is also intended to replace the language revisions of Mods: 8137 and 8139.]***

**Delete and replace as noted:**

**~~C403.2.14 Refrigeration equipment performance.~~**

~~Refrigeration equipment, as defined in 10  CFR part 431,have an energy use in kWh/day not greater than the values of Tables C403.2.14(1)and C403.2.14(2) when tested and rated in accordance with AHRI Standard 120010  CFR part 431.The energy use shall be verified through certification under an approved certification program or, where a certification program does not exist, the energy use shall be supported by data furnished by the equipment manufacturer.~~

~~TABLE C403.2.14(1)~~

~~MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL REFRIGERATION~~

|  |  |  |  |
| --- | --- | --- | --- |
| **~~EQUIPMENT TYPE~~** | **~~APPLICATION~~** | **~~ENERGY USE LIMITS~~****~~(kWh per day)~~~~a~~** | **~~TEST PROCEDURE~~** |
| ~~Refrigerator with solid doors~~ | ~~Holding Temperature~~ | ~~0.10 • V + 2.04~~ | ~~AHRI 1200~~~~10 CFR Part 431~~ |
| ~~Refrigerator with transparent doors~~ | ~~0.12 • V + 3.34~~ |
| ~~Freezers with solid doors~~ | ~~0.40 • V + 1.38~~ |
| ~~Freezers with transparent doors~~ | ~~0.75 • V + 4.10~~ |
| ~~Refrigerators/freezers with solid doors~~ | ~~the greater of 0.12 · V + 3.34~~~~0.27AV-0.71 or 0.70~~ |
| ~~Commercial refrigerators~~ | ~~Pulldown~~ | ~~0.126 • V + 3.51~~ |

~~1. a.V = volume of the chiller or frozen compartment as defined in AHAM-HRF-1.~~

**~~TABLE C403.2.14(2) MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL REFRIGERATORS AND FREEZERS~~**

|  |  |  |
| --- | --- | --- |
| **~~EQUIPMENT TYPE~~** | **~~ENERGY USE LIMITS~~****~~(kWh/day)~~~~a,b~~** | **~~TEST~~****~~PROCEDURE~~** |
| **~~Equipment Classc~~** | **~~Family Code~~** | **~~Operating Mode~~** | **~~Rating Temperature~~** |
| ~~VOP.RC.M~~ | ~~Vertical open~~ | ~~Remote condensing~~ | ~~Medium~~ | ~~0.82 • TDA + 4.07~~ | ~~AHRI 1200~~~~10 CFR Part 431~~ |
| ~~SVO.RC.M~~ | ~~Semivertical open~~ | ~~Remote condensing~~ | ~~Medium~~ | ~~0.83 • TDA + 3.18~~ |
| ~~HZO.RC.M~~ | ~~Horizontal open~~ | ~~Remote condensing~~ | ~~Medium~~ | ~~0.35 • TDA + 2.88~~ |
| ~~VOP.RC.L~~ | ~~Vertical open~~ | ~~Remote condensing~~ | ~~Low~~ | ~~2.27 • TDA + 6.85~~ |
| ~~HZO.RC.L~~ | ~~Horizontal open~~ | ~~Remote condensing~~ | ~~Low~~ | ~~0.57 • TDA + 6.88~~ |
| ~~VCT.RC.M~~ | ~~Vertical transparent door~~ | ~~Remote condensing~~ | ~~Medium~~ | ~~0.22 TDA + 1.95~~ |
| ~~VCT.RC.L~~ | ~~Vertical transparent door~~ | ~~Remote condensing~~ | ~~Low~~ | ~~0.56 • TDA + 2.61~~ |
| ~~SOC.RC.M~~ | ~~Service over counter~~ | ~~Remote condensing~~ | ~~Medium~~ | ~~0.51 • TDA + 0.11~~ |
| ~~VOP.SC.M~~ | ~~Vertical open~~ | ~~Self-contained~~ | ~~Medium~~ | ~~1.74 • TDA + 4.71~~ |
| ~~SVO.SC.M~~ | ~~Semivertical open~~ | ~~Self-contained~~ | ~~Medium~~ | ~~1.73 • TDA + 4.59~~ |
| ~~HZO.SC.M~~ | ~~Horizontal open~~ | ~~Self-contained~~ | ~~Medium~~ | ~~0.77 • TDA + 5.55~~ |
| ~~HZO.SC.L~~ | ~~Horizontal open~~ | ~~Self-contained~~ | ~~Low~~ | ~~1.92 • TDA + 7.08~~ |
| ~~VCT.SC.I~~ | ~~Vertical transparent door~~ | ~~Self-contained~~ | ~~Ice cream~~ | ~~0.67 • TDA + 3.29~~ |
| ~~VCS.SC.I~~ | ~~Vertical solid door~~ | ~~Self-contained~~ | ~~Ice cream~~ | ~~0.38 • V + 0.88~~ |
| ~~HCT.SC.I~~ | ~~Horizontal transparent door~~ | ~~Self-contained~~ | ~~Ice cream~~ | ~~0.56 • TDA + 0.43~~ |
| ~~SVO.RC.L~~ | ~~Semivertical open~~ | ~~Remote condensing~~ | ~~Low~~ | ~~2.27 • TDA + 6.85~~ |
| ~~VOP.RC.I~~ | ~~Vertical open~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~2.89 • TDA + 8.7~~ |
| ~~SVO.RC.I~~ | ~~Semivertical open~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~2.89 • TDA + 8.7~~ |
| ~~HZO.RC.I~~ | ~~Horizontal open~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~0.72 • TDA + 8.74~~ |
| ~~VCT.RC.I~~ | ~~Vertical transparent door~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~0.66 • TDA + 3.05~~ |
| ~~HCT.RC.M~~ | ~~Horizontal transparent door~~ | ~~Remote condensing~~ | ~~Medium~~ | ~~0.16 • TDA + 0.13~~ |
| ~~HCT.RC.L~~ | ~~Horizontal transparent door~~ | ~~Remote condensing~~ | ~~Low~~ | ~~0.34 • TDA + 0.26~~ |
| ~~HCT.RC.I~~ | ~~Horizontal transparent door~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~0.4 • TDA + 0.31~~ |
| ~~VCS.RC.M~~ | ~~Vertical solid door~~ | ~~Remote condensing~~ | ~~Medium~~ | ~~0.11 • V + 0.26~~ |
| ~~VCS.RC.L~~ | ~~Vertical solid door~~ | ~~Remote condensing~~ | ~~Low~~ | ~~0.23 • V + 0.54~~ |
| ~~VCS.RC.I~~ | ~~Vertical solid door~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~0.27 • V + 0.63~~ |
| ~~HCS.RC.M~~ | ~~Horizontal solid door~~ | ~~Remote condensing~~ | ~~Medium~~ | ~~0.11 • V + 0.26~~ |
| ~~HCS.RC.L~~ | ~~Horizontal solid door~~ | ~~Remote condensing~~ | ~~Low~~ | ~~0.23 • V + 0.54~~ |
| ~~HCS.RC.I~~ | ~~Horizontal solid door~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~0.27 • V + 0.63~~ |
| ~~HCS.RC.I~~ | ~~Horizontal solid door~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~0.27 • V + 0.63~~ |
| ~~SOC.RC.L~~ | ~~Service over counter~~ | ~~Remote condensing~~ | ~~Low~~ | ~~1.08 • TDA + 0.22~~ |
| ~~SOC.RC.I~~ | ~~Service over counter~~ | ~~Remote condensing~~ | ~~Ice cream~~ | ~~1.26 • TDA + 0.26~~ |
| ~~VOP.SC.L~~ | ~~Vertical open~~ | ~~Self-contained~~ | ~~Low~~ | ~~4.37 • TDA + 11.82~~ |
| ~~VOP.SC.I~~ | ~~Vertical open~~ | ~~Self-contained~~ | ~~Ice cream~~ | ~~5.55 • TDA + 15.02~~ |
| ~~SVO.SC.L~~ | ~~Semivertical open~~ | ~~Self-contained~~ | ~~Low~~ | ~~4.34 • TDA + 11.51~~ |
| ~~SVO.SC.I~~ | ~~Semivertical open~~ | ~~Self-contained~~ | ~~Ice cream~~ | ~~5.52 • TDA + 14.63~~ |
| ~~HZO.SC.I~~ | ~~Horizontal open~~ | ~~Self-contained~~ | ~~Ice cream~~ | ~~2.44 • TDA + 9.0~~ |
| ~~SOC.SC.I~~ | ~~Service over counter~~ | ~~Self-contained~~ | ~~Ice cream~~ | ~~1.76 • TDA + 0.36~~ |
| ~~HCS.SC.I~~ | ~~Horizontal solid door~~ | ~~Self-contained~~ | ~~Ice cream~~ | ~~0.38 • V + 0.88~~ |

~~a.V = Volume of the case, as measured in accordance with Appendix C of AHRI 1200.~~

~~b.TDA = Total display area of the case, as measured in accordance with Appendix D of AHRI 1200.~~

~~c.Equipment class designations consist of a combination [(in sequential order separated by periods (AAA).(BB).(C))] of:~~

~~(AAA)An equipment family code where:~~

~~VOP     =          vertical open~~

~~SVO     =          semivertical open~~

~~HZO     =          horizontal open~~

~~VCT     =          vertical transparent doors~~

~~VCS     =          vertical solid doors~~

~~HCT     =          horizontal transparent doors~~

~~HCS     =          horizontal solid doors~~

~~SOC     =          service over counter~~

~~(BB)    An operating mode code:~~

~~RC       =          remote condensing~~

~~SC        =          self-contained~~

~~(C)      A rating temperature code:~~

~~M         =          medium temperature (38°F)~~

~~L          =          low temperature (0°F)~~

~~I           =          ice-cream temperature (15°F)~~

~~For example, “VOP.RC.M” refers to the “vertical-open, remote-condensing, medium-temperature” equipment class.~~

**~~C403.2.15 Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers.~~**

*~~Refrigerated warehouse coolers~~*~~and~~*~~refrigerated warehouse freezers~~*~~shall comply with this section.~~*~~Walk-in coolers~~*~~and~~*~~walk-in freezers~~*~~that are not either site assembled or site constructed shall comply with the following:~~

~~Exception: Walk-in coolers and walk-in freezers regulated under federal law by the Department of Energy in 10 CFR 431, Subpart R - Walk-in Coolers and Walk-in Freezers.~~

~~1. Be equipped with automatic door-closers that firmly close walk-in doors~~

~~that have been closed to within 1 inch (25 mm) of full closure.~~

~~Exception: Automatic closers are not required for doors more than 45 inches (1143 mm) in width or more than 7 feet (2134 mm) in height.~~

~~2. Doorways shall have strip doors, curtains, spring hinged doors or other method of minimizing infiltration when doors are open.~~

~~3. Walk-in coolers and refrigerated warehouse coolers shall contain wall, ceiling, and door insulation of not less than R-25 and walk-in freezers and refrigerated warehouse freezers shall contain wall, ceiling and door insulation of not less than R-32.~~

~~Exception: Glazed portions of doors or structural members need not be insulated.~~

~~4. Walk-in freezers shall contain floor insulation of not less than R-28.~~

~~5. Transparent reach-in doors for walk-in freezers and windows in walk-in freezer doors shall be of triple-pane glass, either filled with inert gas or with heat-reflective treated glass.~~

~~6. Windows and transparent reach-in doors for walk-in coolers shall be of double-pane or triple pane, inert gas-filled, heat-reflective treated glass.~~

~~7. Evaporator fan motors that are less than 1 hp (0.746 kW) and less than 460 volts shall use electronically commutated motors, brushless direct current motors, or 3-phase motors.~~

~~8. Condenser fan motors that are less than 1 hp (0.746 kW) shall use electronically commutated motors, permanent split capacitor-type motors or 3-phase motors.~~

~~9. Where antisweat heaters without antisweat heater controls are provided, they shall have a total door rail, glass and frame heater power draw of not more than 7.1 W/ft2 (76 W/m2) of door opening for walk-in freezersand 3.0 W/ft2 (32 W/m2) of door opening for walk-in coolers.~~

~~10. Where antisweat heater controls are provided, they shall reduce the energy use of the antisweat heater as a function of the relative humidity in the air outside the door or to the condensation on the inner glass pane.~~

~~11. Lights in walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall either use light sources with an efficacy of not less than 40 lumens per watt, including ballast losses, or shall use light sources with an efficacy of not less than 40 lumens per watt, including ballast losses, in conjunction with a device that turns off the lights within 15 minutes when the space is not occupied.~~

**~~C403.2.16 Walk-in coolers and walk-in freezers.~~**

~~Site-assembled or site-constructed~~*~~walk-in coolers~~*~~and~~*~~walk-in freezers~~*~~shall comply with the following:~~

~~Exception: Walk-in coolers and walk-in freezers regulated under federal law by the Department of Energy in 10 CFR 431, Subpart R - Walk-in Coolers and Walk-in Freezers.~~

~~1. Automatic door closers shall be provided that fully close walk-in doors that have been closed to within 1 inch (25 mm) of full closure.~~

**~~Exception:~~**~~Closers are not required for doors more than 45 inches (1143 mm) in width or more than 7 feet (2134 mm) in height.~~

~~2. Doorways shall be provided with strip doors, curtains, spring-hinged doors or other method of minimizing infiltration when the doors are open.~~

~~3. Walls shall be provided with insulation having a thermal resistance of not less than R-25, ceilings shall be provided with insulation having a thermal resistance of not less than R-25 and doors of~~*~~walk-in coolers~~*~~and~~*~~walk-in freezers~~*~~shall be provided with insulation having a thermal resistance of not less than R-32.~~

**~~Exception:~~**~~Insulation is not required for glazed portions of doors or at structural members associated with the walls, ceiling or door frame.~~

~~4. The floor of~~*~~walk-in freezers~~*~~shall be provided with insulation having a thermal resistance of not less than R-28.~~

~~5. Transparent reach-in doors for and windows in opaque~~*~~walk-in freezer~~*~~doors shall be provided with triple-pane glass having the interstitial spaces filled with inert gas or provided with heat-reflective treated glass.~~

~~6. Transparent reach-in doors for and windows in opaque~~*~~walk-in cooler~~*~~doors shall be double-pane heat-reflective treated glass having the interstitial space gas filled.~~

~~7. Evaporator fan motors that are less than 1 hp (0.746 kW) and less than 460 volts shall be electronically commutated motors or 3-phase motors.~~

~~8. Condenser fan motors that are less than 1 hp (0.746 kW) in capacity shall be of the electronically commutated or permanent split capacitor-type or shall be 3-phase motors.~~

**~~Exception:~~**~~Fan motors in~~*~~walk-in coolers~~*~~and~~*~~walk-in freezers~~*~~combined in a single enclosure greater than 3,000 square feet (279 m~~~~2~~~~) in floor area are exempt.~~

~~9. Antisweat heaters that are not provided with antisweat heater controls shall have a total door rail, glass and frame heater power draw not greater than 7.1 W/ft~~~~2~~~~(76 W/m~~~~2~~~~) of door opening for~~*~~walk-in freezers~~*~~, and not greater than 3.0 W/ft~~~~2~~~~(32 W/m~~~~2~~~~) of door opening for~~*~~walk-in coolers~~*~~.~~

~~10. Antisweat heater controls shall be capable of reducing the energy use of the antisweat heater as a function of the relative humidity in the air outside the door or to the condensation on the inner glass pane.~~

~~11. Light sources shall have an efficacy of not less than 40 lumens per Watt, including any ballast losses, or shall be provided with a device that automatically turns off the lights within 15 minutes of when the~~*~~walk-in cooler~~*~~or~~*~~walk-in freezer~~*~~was last occupied.~~

**~~C403.2.17 Refrigerated display cases.~~**

~~Site-assembled or site-constructed refrigerated display cases shall comply with the following:~~

~~Exception: Refrigerated display cases regulated under federal law by the Department of Energy in 10 CFR 431, Subpart C - Commercial Refrigerators, Freezers and Refrigerator-Freezers.~~

~~1. Lighting and glass doors in refrigerated display cases shall be controlled by one of the following:~~

~~1.1 Time switch controls to turn off lights during nonbusiness hours. Timed overrides for display cases shall turn the lights on for up to 1 hour and shall automatically time out to turn the lights off.~~

~~1.2 Motion sensor controls on each display case section that reduce lighting power by at least 50 percent within 3 minutes after the area within the sensor range is vacated.~~

~~2. Low-temperature display cases shall incorporate temperature-based defrost termination control with a time-limit default. The defrost cycle shall terminate first on an upper temperature limit breach and second upon a time limit breach.~~

~~3. Antisweat heater controls shall reduce the energy use of the antisweat heater as a function of the relative humidity in the air outside the door or to the condensation on the inner glass pane.~~

**~~C403.2.16.1 Performance standards.~~** ~~Effective January 1, 2020, walk-in coolers and walk-in freezers shall meet the requirements of Tables C403.2.16.1(1), C403.2.16.1(2) and C403.2.16.1(3)~~

**~~TABLE C403.2.16.1(1)~~**

 **~~Walk-in Cooler and Freezer Display Doors Efficiency Requirements~~**

|  |  |  |
| --- | --- | --- |
| ~~Class Descriptor~~ | ~~Class~~ | ~~Maximum Energy Consumption (kWh/day)~~~~a~~ |
| ~~Display Door, Medium Temperature~~ | ~~DD, M~~ | ~~0.04 x A~~~~dd~~ ~~+ 0.41~~ |
| ~~Display Door, Low Temperature~~ | ~~DD, L~~ | ~~0.15 x A~~~~dd~~ ~~+ 0.29~~ |

~~a. Add is the surface area of the display door.~~

**~~TABLE C403.2.16.1(2)~~**

**~~Walk-in Cooler and Freezer Non-Display Doors Efficiency Requirements~~**

|  |  |  |
| --- | --- | --- |
| ~~Class Descriptor~~ | ~~Class~~ | ~~Maximum Energy Consumption (kWh/day)~~~~a~~ |
| ~~Passage Door, Medium Temperature~~ | ~~PD, M~~ | ~~0.05 x A~~~~nd~~ ~~+ 1.7~~ |
| ~~Passage Door, Low Temperature~~ | ~~PD, L~~ | ~~0.14 x A~~~~nd~~ ~~+ 4.8~~ |
| ~~Freight Door, Medium Temperature~~ | ~~PD, M~~ | ~~0.04 x A~~~~nd~~ ~~+ 1.9~~ |
| ~~Freight Door, Medium Temperature~~ | ~~PD, L~~ | ~~0.12 x A~~~~nd~~ ~~+ 5.6~~ |

**~~TABLE C403.2.16.1(3)~~**

**~~Walk-in Cooler and Freezer Refrigeration Systems Efficiency Requirements~~**

|  |  |  |
| --- | --- | --- |
| ~~Class Descriptor~~ | ~~Class~~ | ~~Minimum Annual Walk-In Energy Factor AWEF (Btu/W-h)~~ |
| ~~Dedicated Condensing, Medium Temperature, Indoor System~~ | ~~DC.M.I~~ | ~~5.61~~ |
| ~~Dedicated Condensing, Medium Temperature, Indoor System, > 9,000 Btu/h Capacity~~ | ~~DC.M.I, > 9,000~~ | ~~5.61~~ |
| ~~Dedicated Condensing, Medium Temperature, Outdoor System~~ | ~~DC.M.I~~ | ~~7.60~~ |
| ~~Dedicated Condensing, Medium Temperature, Outdoor System, > 9,000 Btu/h Capacity~~ | ~~DC.M.I, > 9,000~~ | ~~7.60~~ |

**Revise and replace with the following:**

**C402.1 General (Prescriptive).**

Building thermal envelope assemblies for buildings that are intended to comply with the code on a prescriptive basis in accordance with the compliance path described in Item 2 of Section C401.2, shall comply with the following:

1. The opaque portions of the building thermal envelope shall comply with the specific insulation requirements of Section C402.2 and the thermal requirements of either the R-value-based method of Section C402.1.3; the U-, C- and F-factor-based method of Section C402.1.4; or the component performance alternative of Section C402.1.5.

2. Roof solar reflectance and thermal emittance shall comply with Section C402.3.

3. Fenestration in building envelope assemblies shall comply with Section C402.4.

4. Air leakage of building envelope assemblies shall comply with Section C402.5.

Alternatively, where buildings have a vertical fenestration area or skylight area exceeding that allowed in Section C402.4, the building and building thermal envelope shall comply with Section C401.2, Item 1 or Section C401.2, Item 3.

Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with Section C403.2.14.

**C403.2.14 Refrigeration equipment performance.**

Refrigeration equipment performance shall be determined in accordance with sections C403.2.14.1 and C403.2.14.2 for commercial refrigerators, freezers, refrigerator-freezers, walk-in coolers, walk-in freezers and refrigeration equipment. The energy use shall be verified through certification under an approved certification program or, where a certification program does not exist, the energy use shall be supported by data furnished by the equipment manufacturer.

Exception: Walk-in coolers and walk-in freezers regulated under federal law in accordance with Subpart R of 10 CFR 431.

**C403.2.14.1 Commercial refrigerators, freezers, refrigerator-freezers and refrigeration (Mandatory).** Refrigeration equipment, defined in U.S. 10 CFR part 431.62, shall have an energy use in kWh/day not greater than the values of Table C403.2.14.1(1) when tested and rated in accordance with AHRI Standard 1200.

**TABLE C403.2.14.1(1) MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL REFRIGERATORS AND FREEZERS AND REFRIGERATION**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Equipment Category | Condensing Unit Conﬁguration | Equipment Family | Rating Temp (F) | Operating Temp (F) | Equipment Classiﬁcationc | Maximum daily energy consumption kWh/day d,e | Test Standard |
| Remote Condensing Commercial Refrigerators and Commercial Freezers | Remote (RC) | Vertical Open (VOP) | 38 (M) | ≥32 | VOP.RC.M | 0.64 x TDA+4.07 | AHRI 1200 |
| 0 (L) | <32 | VOP.RC.L | 2.20 x TDA +6.85 |
| Semivertical Open (SVO) | 38 (M) | ≥32 | SVO.RC.M | 0.66 x TDA+ 3.18 |
| 0 (L) | <32 | SVO.RC.L | 2.20 x TDA +6.85 |
| Horizontal Open (HZO) | 38 (M) | ≥32 | HZO.RC.M | 0.35 x TDA +2.88 |
| 0 (L) | <32 | HZO.RC.L | 0.55 x TDA +6.88 |
| Vertical Closed Transparent (VCT) | 38 (M) | ≥32 | VCT.RC.M | 0.15 x TDA +1.95 |
| 0 (L) | <32 | VCT.RC.L | 0.49 x TDA +2.61 |
| Horizontal Closed Transparent (HCT) | 38 (M) | ≥32 | HCT.RC.M | 0.16 x TDA +0.13 |
| 0 (L) | <32 | HCT.RC.L | 0.34 x TDA +0.26 |
| Vertical Closed Solid (VCS) | 38 (M) | ≥32 | VCS.RC.M | 0.10 x V +0.26 |
| 0 (L) | <32 | VCS.RC.L | 0.21 x V +0.54 |
| Horizontal Closed Solid (HCS) | 38 (M) | ≥32 | HCS.RC.M | 0.10 x V+0.26 |
| 0 (L) | <32 | HCS.RC.L | 0.21 x V +0.54 |
| Service Over Counter (SOC) | 38 (M) | ≥32 | SOC.RC.M | 0.44 x TDA +0.11 |
| 0 (L) | <32 | SOC.RC.L | 0.93 x TDA +0.22 |
|  |  | Vertical Open | 38 (M) | ≥32 | VOP.SCSV.M | 1.69 x TDA + 4.71 |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Self-Contained Commercial Refrigerators and Commercial Freezers with and Without Doors | Self- Contained (SC) | (VOP) | 0 (L) | <32 |  | TDA + 11.82 | AHRI 1200 |
| Semivertical Open (SVO) | 38 (M) | ≥32 | SVO.SC.M | 1.70 x TDA +4.59 |
| 0 (L) | <32 | SVO.SC.L | 4.26 x TDA+11.51 |
| Horizontal Open (HZO) | 38 (M) | ≥32 | HZO.SC.M | 0.72 x TDA +5.55 |
| 0 (L) | <32 | HZO.SC.L | 1.90 x TDA +7.08 |
| Vertical Closed Transparent (VCT) | 38 (M) | ≥32 | VCT.SC.M | 0.10 x V +0.86 |
| 0 (L) | <32 | VCT.SC.L | 0.29 x V+2.95 |
| Vertical Closed Solid (VCS) | 38 (M) | ≥32 | VCS.SC.M | 0.05 x V +1.36 |
| 0 (L) | <32 | VCS.SC.L | 0.22 x V +1.38 |
| Horizontal Closed Transparent (HCT) | 38 (M) | ≥32 | HCT.SC.M | 0.06 x V +0.37 |
| 0 (L) | <32 | HCT.SC.L | 0.08 x V +1.23 |
| Horizontal Closed Solid (HCS) | 38 (M) | ≥32 | HCS.SC.M | 0.05 x V +0.91 |
| 0 (L) | <32 | HCS.SC.L | 0.06 x V +1.12 |
| Service Over Counter (SOC) | 38 (M) | ≥32 | SOC.SC.M | 0.52 x TDA +1.00 |
| 0 (L) | <32 | SOC.SC.L | 1.10 x TDA +2.10 |
| Self-Contained Commercial Refrigerators with Transparent Doors for Pull-Down Temperature Applications | Self- Contained (SC) | Pull-Down (PD) | 38 (M) | ≥32 | PD.SC.M | 0.11 x V +0.81 | AHRI 1200 |
|  | Remote (RC) | Vertical Open (VOP) | -15 (I) | ≤-5b | VOP.RC.I | 2.79 x TDA +8.70 | AHRI 1200 |
| Semivertical Open (SVO) | -15 (I) | ≤-5b | SVO.RC.I | 2.79 x TDA +8.70 |
| Horizontal Open (HZO) | -15 (I) | ≤-5 b | HZO.RC.I | 0.7 x TDA +8.74 |
| Vertical Closed Transparent (VCT) | -15 (I) | ≤-5 b | VCT.RC.I | 0.58 x TDA +3.05 |
| Horizontal Closed Transparent (HCT) | -15 (I) | ≤-5 b | HCT.RC.I | 0.4 x TDA +0.31 |
| Vertical Closed Solid (VCS) | -15 (I) | ≤-5 b | VCS.RC.I | 0.25 x V +0.63 |
| Horizontal Closed Solid (HCS) | -15 (I) | ≤-5 b | HCS.RC.I | 0.25 x V +0.63 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Commercial Ice-Cream Freezers |  | Service Over Counter (SOC) | -15 (I) | ≤-5 b | SOC.RC.I | 1.09 x TDA + 0.26 |  |
| Self- Contained (SC) | Vertical Open (VOP) | -15 (I) | ≤-5 b | VOP.SC.I | 5.4 x TDA +15.02 | AHRI 1200 |
| Semivertical Open (SVO) | -15 (I) | ≤-5 b | SVO.SC.I | 5.41 x TDA +14.63 |
| Horizontal Open (HZO) | -15 (I) | ≤-5 b | HZO.SC.I | 2.42 x TDA9.00 |
| Vertical Closed Transparent (VCT) | -15 (I) | ≤-5 b | VCT.SC.I | 0.62 xTDA + 3.29 |
| Horizontal Closed Transparent (HCT) | -15 (I) | ≤-5 b | HCT.SC.I | 0.56 x TDA +0.43 |
| Vertical Closed Solid(VCS) | -15 (I) | ≤-5 b | VCS.SC.I | 0.34 × V +0.88. |
| Horizontal Closed Solid(HCS) | -15 (I) | ≤-5 b | HCS.SC.I | 0.34 × V +0.88. |
| Service Over Counter(SOC) | -15 (I) | ≤-5 b | SOC.SC.I | 1.53 x TDA +0.36 |

a. The meaning of the letters in this column is indicated in the columns to the left.

b. Ice-cream freezer is defined in 10 CFR 431.62 as a commercial freezer that is designed to operate at or below −5 °F and that the manufacturer designs, markets, or intends for the storing, displaying, or dispensing of ice cream.

c. Equipment class designations consist of a combination (in sequential order separated by periods (AAA).(BB). (C)) of the following: (AAA)—An equipment family code (VOP = vertical open, SVO = semivertical open, HZO = horizontal open, VCT = vertical closed transparent doors, VCS = vertical closed solid doors, HCT = horizontal closed transparent doors, HCS = horizontal closed solid doors, and SOC = service over counter); (BB)—An operating mode code (RC = remote condensing and SC = self-contained); and (C)—A rating temperature code (M = medium temperature [38°F], L = low temperature [0°F], or I = ice cream temperature [-15°F]). For example, “VOP.RC.M” refers to the “vertical open, remote condensing, medium temperature” equipment class.

d. V is the volume of the case (ft ) as measured in AHRI Standard 1200, Appendix C.

e. TDA is the total display area of the case (ft ) as measured in AHRI Standard 1200, Appendix D.

**C403.2.14.2 Walk-in coolers, walk-in freezers (Mandatory).**

Walk-in cooler and walk-in freezer refrigeration systems, except for walk-in process cooling refrigeration systems as defined in U.S. 10 CFR 431.302, shall meet the requirements of Tables C403.2.14(1), C403.2.14(2), and C403.2.14(3).

**TABLE C403.2.14.2(1) WALK-IN COOLER AND FREEZER DISPLAY DOOR EFFICIENCY REQUIREMENTSa**

|  |  |  |
| --- | --- | --- |
| **CLASS DESCRIPTOR** | **CLASS** | **MAXIMUM ENERGY CONSUMPTION (kWh/day)** |
| Display door, medium temperature | DD, M | 0.04 x Add + 0.41 |
| Display door, low temperature | DD, L | 0.15 x Add + 0.29 |

1. Add is the surface area of the display door.

**TABLE C403.2.14.2(2) WALK-IN COOLER AND FREEZER NONDISPLAY DOOR EFFICIENCY REQUIREMENTSa**

|  |  |  |
| --- | --- | --- |
| **CLASS DESCRIPTOR** | **CLASS** | **MAXIMUM ENERGY CONSUMPTION (kWh/day)** |
| Passage door, medium temperature | PD, M | 0.05 x And + 1.7 |
| Passage door, low temperature | PD, L | 0.14 x And + 4.8 |
| Freight door, medium temperature | FD, M | 0.04 x And + 1.9 |
| Freight door, low temperature | FD, L | 0.12 x And + 5.6 |

1. And is the surface area of the display door.

**TABLE C403.2.14.2(3) WALK-IN COOLER AND FREEZER REFRIGERATION SYSTEM EFFICIENCY REQUIREMENTS**

|  |  |  |  |
| --- | --- | --- | --- |
| **CLASS DESCRIPTOR** | **CLASS** | **MINIMUM ANNUAL WALK-IN ENERGY FACTOR AWEF (Btu/W-h)a** | **TEST PROCEDURE** |
| Dedicated condensing, medium temperature, indoor system | DC.M.I | 5.61 | AHRI 1250 |
| Dedicated condensing, medium temperature, outdoor system | DC.M.O | 7.60 |
| Dedicated condensing, low temperature, indoor system, net capacity (qnet) < 6,500 Btu/h | DC.L.I, < 6,500 | 9.091 x 10-5 x qnet + 1.81 |
| Dedicated condensing, low temperature, indoor system, net capacity (qnet) ≥ 6,500 Btu/h | DC.L.I, ≥ 6,500 | 2.40 |
| Dedicated condensing, low temperature, outdoor system, net capacity (qnet) < 6,500 Btu/h | DC.L.O, < 6,500 | 6.522 x 10-5 x qnet + 2.73 |
| Dedicated condensing, low temperature, outdoor system, net capacity (qnet) ≥ 6,500 Btu/h | DC.L.O, ≥ 6,500 | 3.15 |
| Unit cooler, medium | UC.M | 9.00 |
| Unit cooler, low temperature, net capacity (qnet) < 15,500 Btu/h | UC.L,< 15,500 Btu/h | 1.575 x 10-5 x qnet + 3.91 |
| Unit cooler, low temperature, net capacity (qnet) ≥ 15,500 Btu/h | UC.L,≥ 15,500 Btu/h | 4.15 |

a. qnet is net capacity (Btu/hr) as determined in accordance with AHRI Standard 1250

 (EN-CE-Ch.4- Comment #10)

**CHAPTER 6 [CE] REFERENCED STANDARDS**

**Referenced Standards:**

DOE

U.S. 10 Part CFR 431, Subpart R: Commercial Refrigerators, Freezers and Refrigerator-Freezers

AHRI

AHRI 1250-(I-P) 2014: Standard for Performance Rating in Walk-in Coolers and Freezers

(EN-CE-Ch.4- Comment #10)

**Duct Leakage Test Report**



|  |  |
| --- | --- |
| System 1 |  cfm25 |
| System 2 |  cfm25 |
| System 3 |  cfm25 |
| Sum of anyothers |  cfm25 |
| Total of all |  cfm25 |

Residential Prescriptive, Performance or ERI Method Compliance 2020 Florida Building Code, Energy Conservation, 7th Edition

|  |  |  |  |
| --- | --- | --- | --- |
|  | Jurisdiction: | Permit | #: |
| **Job Information** |
| Builder: | Community: | Lot: |
| Address: |
| City: | State: FL | Zip: |
| **Duct Leakage Test Results** |  **Prescriptive Method** |  **Performance/ERI Method** |
| **Prescriptive Method** cfm25 (Total)To qualify as "substantially leak free" Qn Total must be less than or equal to 0.04 if air handler unit is installed. If air handler unit is not installed, Qn Total must be less than or equal to 0.03. This testing method meets the requirements in accordance with Section R403.3.3.*Is the air handler unit installed during testing?* YES ( = .04) NO ( = .03)Qn Qn **Performance/ERI Method** cfm25 (Out or Total)To qualify using this method, Qn must not be greater than the proposed ÷ = Qn duct leakage Qn specified on Form R405-2020 or R406-2020.Total of all Total Conditionedsystems Square Footage *Leakage Type selected on Form Qn specified on Form R405-2020**R405-2020 (EnergyCalc) or R406-2020 (EnergyCalc) or R406-2020***PASS FAIL**Duct tightness shall be verified by testing in accordance with ANSI/RESNET/ICC380 by either individuals as defined in Section 553.993(5) or (7), Florida Statutes, or individuals licensed as set forth in Section 489.105(3)(f), (g) or (i), Florida Statutes. |
|  | Testing Company |
| Company Name: Phone: I hereby verify that the above duct leakage testing results are in accordance with the Florida Building Code requirements with the selected compliance path as stated above, either the Prescriptive Method or Performance Method.Signature of Tester: Date of Test: Printed Name of Tester: License/Certification #: Issuing Authority:  |

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(EN-RE-RD- Comment #1)