

This fact sheet is intended to help industry professionals understand changes made to the 2016 Title 24, Part 6 Building Energy Efficiency Standards (Energy Code or Title 24, Part 6) and incorporated in the 2019 Energy Code for nonresidential, high-rise residential and hotel/motel building occupancy types. It is presented in tabular form and divided by building feature (e.g., envelope and lighting). Each building feature section includes explanatory notes on all applicable Title 24, Part 6 sections, but not the actual language of the 2019 Energy Code. Notes on Title 24, Part 1 sections are also included, as applicable. The left-hand column serves to note the Title 24 sub-sections and to highlight related key comments.

There is a similar fact sheet covering changes for the [low-rise residential occupancy type](#).

### Legend

Background colors are used to indicate the degree of change to the 2016 Energy Code.

No Change or Minor Change for 2019 - "Minor Changes" are considered non-substantive changes to code language and typically no further clarification is provided.

Revised for 2019

New for 2019

### Key Definitions

- Multifamily:** Occupancies R-1 and R-2 (R-3 includes single family, duplexes and townhomes 3-habitable stories or less above grade, and is subject to the single-family requirements of the Energy Code):
  - Multifamily buildings 3-habitable stories or less above grade are addressed in the **residential** requirements of the Energy Code (§§150.0, 150.1, 150.2)
  - Multifamily buildings 4-habitable stories or more above grade are addressed in the **nonresidential** requirements of the Energy Code (§§130-141)
- Healthcare Facilities:** Occupancies I-1 and I-2 are now covered by the requirements of the Energy Code with this 2019 code cycle. There are many exceptions, so see the section devoted to Exceptions for Healthcare Facilities. Occupancy I-3 and I-4 are still not subject to the requirements of Title 24, Part 6.

## For More Information

### California Energy Commission Information & Services

- 2019 Title 24, Part 6 Document (December 2018):  
[www.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf](http://www.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf)
- Draft 2019 Energy Code - October 4 & 5, 2017: Staff Workshop on the Draft 2019 Building Energy Standards ("marked up" for easier viewing of changes):  
[www.energy.ca.gov/title24/2019standards/prerulemaking/documents/2017-10-0405\\_workshop/2017-10-0405\\_documents.php](http://www.energy.ca.gov/title24/2019standards/prerulemaking/documents/2017-10-0405_workshop/2017-10-0405_documents.php)
- Energy Code Hotline: 1-800-772-3300 (Free) or [Title24@energy.ca.gov](mailto:Title24@energy.ca.gov)
- Online Resource Center:  
[energy.ca.gov/title24/orc/](http://energy.ca.gov/title24/orc/)
  - The Energy Commission's main web portal for Energy Code, including information, documents and historical information

### Energy Code Ace Information & Services





- Reference Ace™ – Easily navigate Title 24, Part 6 documents using search and hyperlinks
  - 2019 Energy Code
  - 2016 Energy Code
- Training
  - [Title 24: Where We're Headed with the 2019 Standards](#)
  - [2019 Title 24, Part 6: Where We're Headed With the Nonresidential Standards](#)
- Energy Code Ace Tools, Training and Resources Updated for the 2019 Code - Coming Soon! Register with [EnergyCodeAce.com](http://EnergyCodeAce.com) and select a role in My Profile to receive emails when they are published!

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# MECHANICAL

Color background indicates:  NO CHANGE/MINOR CHANGE  REVISED  NEW FOR 2019

Building Application	 <b>Mandatory</b>		 <b>Prescriptive</b>	 <b>Performance</b>	 <b>Additions Alterations</b>
	All Occupancy Subchapters 1-2 (§§100.0-110.11)	Nonresidential Occupancy Subchapter 3 (§§120.0-120.9)	Subchapter 8 (§150.1)	Subchapter 8 (§150.1)	Subchapter 9 (§150.2)
General	§§100.0, 100.1-2, 110.0, 110.1	§120.0	§§140, 140.2	§§140.0, 140.1	§141.0
HVAC (conditioned)	§§110.2, 110.5	§§120.1, 120.2, 120.3, 120.4, 120.5, 120.8	§140.4		
Water Heating	§110.3	§§120.3, 120.8, 120.9	§140.5		
Pool & Spa Systems	§§110.4, 110.5	See Residential §150.0(p)	N/A	N/A	

**T24 Section & Notes**  **Mandatory – Change Summaries**

**Title 24, Part 1, Section 10-103 – PERMIT, CERTIFICATE, INFORMATIONAL, AND ENFORCEMENT REQUIREMENTS FOR DESIGNERS, INSTALLERS, BUILDERS, MANUFACTURERS, AND SUPPLIERS**

10-103.1 **Nonresidential Acceptance Test Training and Certification:** Changes to how ATTCPs (acceptance test technician certification providers) recertify ATTs (acceptance test technicians) and ATEs (acceptance test employers), and how to deal with those “decertified” by an ATTCP. Quality assurance procedures and reporting have been revised.

**Title 24, Part 1, Section 10-106 – LOCALLY ADOPTED ENERGY STANDARDS**

10-106 Clarification that cost-effectiveness studies submitted as part of applications from public agencies for the adoption of local energy codes must first be made available for public review within the jurisdiction of the public entity, then the Energy Commission must confirm that the cost-effectiveness study demonstrates that the proposed new local code will use less energy than what is permitted by Title 24, Part 6. Only then may it be filed with the Energy Commission.

**Title 24, Part 6, Section 100.0 – Scope**

100.0(h) Clarification that if manufactured equipment, a product or a device is NOT specified in Title 24, Part 6, it will be found in Title 20, Sections 1601-1609.

**Title 24, Part 6, Section 100.1 – Definitions**

Updates to various references to resources and standards other than the Energy Code (e.g., revisions to list newer applicable versions or editions).

**ADIABATIC PAD** is a material located before the heat transfer surface of an adiabatic condenser, which pre-cools the ambient air by becoming fully wetted during pre-cool mode operation.

Definition for ventilation changes. **AIR, AVAILABLE TRANSFER** is that portion of total outdoor ventilation air that is not required to satisfy other exhaust needs or to maintain pressurization of other spaces and that is transferable according to Section 120.1(g).

**CASCADE REFRIGERATION SYSTEM** is a type of refrigeration system that uses a low-stage refrigeration system where the heat rejected from condensing the low-stage refrigerant is absorbed using a heat-exchanger by a separate high-stage refrigeration system, and the ultimate heat rejection to ambient air is accomplished by the highstage refrigeration system.

New definitions to support refrigeration measures. **CONDENSER** is a refrigeration component that condenses refrigerant vapor by rejecting heat to air mechanically circulated over its heat transfer surface.  
**CONDENSER, ADIABATIC** is a condenser that has the ability to use two heat transfer processes in series as accomplished by a single factory-made unit. The first heat transfer process is the pre-cooling of the entering air by lowering the entering air drybulb temperature. The second heat transfer process is forced-air circulation cooling over the heat transfer surface of the condenser.  
**DRY MODE** is an operating condition of an adiabatic condenser wherein the only means of heat transfer is accomplished through forced-air circulation over the heat transfer surface of the condenser without any pre-cooling of the entering air.

	<b>PRE-COOL MODE</b> is an operating condition of an adiabatic condenser wherein the entering air is pre-cooled.
	<b>CONDITIONED SPACE</b> is an enclosed space within a building that is directly conditioned or indirectly conditioned.
Revised to clarify process space conditioning.	<b>CONDITIONED SPACE, DIRECTLY</b> is an enclosed space that is provided with wood heating, mechanical heating that has a capacity exceeding 10 Btu/hr-ft <sup>2</sup> , mechanical cooling that has a capacity exceeding 5 Btu/hr-ft <sup>2</sup> . Directly conditioned space does not include process space. (See PROCESS SPACE.) <b>CONDITIONED SPACE, INDIRECTLY</b> is enclosed space, that (1) is not directly conditioned space; and (2) either (a) has a thermal transmittance area product (UA) to directly conditioned space exceeding that to the outdoors or to unconditioned space and does not have fixed vents or openings to the outdoors or to unconditioned space, or (b) is a space through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour.
	<b>FACTORY</b> is building, structure or space designated as Factory Group F that is used for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations.
Updated refrigeration options.	<b>GAS COOLER</b> is a refrigeration component that reduces the temperature of a refrigerant vapor by rejecting heat to air mechanically circulated over its heat transfer surface. Used by a CO <sub>2</sub> refrigeration system in transcritical mode, and normally also capable of operating in subcritical mode.
Clarifications to habitable space.	<b>HABITABLE SPACE</b> is space in a building for living, sleeping, eating or cooking, excluding bathrooms, toilets, hallways, storage areas, closets, utility rooms and similar areas. (See also OCCUPIABLE SPACE.) <b>HABITABLE STORY</b> is a story that contains habitable space, and that has at least 50% of its volume above grade.
Revised to clarify source energy and how that applies to Energy Code triggers.	<b>MECHANICAL COOLING</b> is lowering the temperature within a space using refrigerant compressors or absorbers, desiccant dehumidifiers, or other systems that require energy to directly condition the space (language regarding energy from depletable sources has been removed). In nonresidential, high-rise residential, and hotel/motel buildings, cooling of a space by direct or indirect evaporation of water alone is not considered mechanical cooling. <b>MECHANICAL HEATING</b> is raising the temperature within a space using electric resistance heaters, fossil fuel burners, heat pumps, or other systems that require energy to directly condition the space. (Language regarding energy from depletable sources has been removed.)
	<b>NATURAL GAS AVAILABILITY:</b> For newly constructed buildings, natural gas is available if a gas service line can be connected to the site without a gas main extension. For additions and alterations, natural gas is available if a gas service line is connected to the existing building.
Revised to align with ASHRAE 90.1.	<b>NONRESIDENTIAL BUILDING OCCUPANCY TYPES:</b> Assembly Building, Commercial and Industrial Storage Building, Financial Institution Building, Industrial/Manufacturing Facility Building, Grocery Store Building, Gymnasium Building, Library Building, Office Building, Parking Garage Building, Religious Facility Building, Restaurant Building, Retail Store Building, School Building, Sports Arena Building, Motion Picture Theater Building, Performance Art Theater Building. (See OCCUPANCY TYPE.) <b>NONRESIDENTIAL FUNCTION AREAS:</b> Revised to align with ASHRAE 90.1
Definitions to support ventilation changes.	<b>OCCUPANCY</b> is the purpose for which a building or part thereof is used or intended to be used. <b>OCCUPANCY, HUMAN</b> is any occupancy that is intended primarily for human activities. <b>OCCUPANCY GROUP</b> is a classification of occupancy defined in Chapter 3 of the California Building Code (CBC) (Title 24, Part 2). <b>OCCUPANCY TYPE</b> is a description of occupancy that is more specific than occupancy group and that relates to determining the amount of lighting, ventilation or other services needed for that portion of the building.
	<b>OCCUPIABLE SPACE</b> is any enclosed space that intended for human occupancy, including, all habitable spaces as well as bathrooms, toilets, closets, halls, storage and utility areas, laundry areas, and similar areas (See also "habitable space".)
	<b>OCCUPIED STANDBY MODE</b> is when a zone is scheduled to be occupied and an occupant sensor indicates zero population within the zone.
Revised definition to the "baseline" building used in Performance software.	<b>STANDARD DESIGN BUILDING</b> is a building that is automatically simulated by Commission-approved compliance software to establish the Energy Budget that is the maximum energy consumption allowed by a Proposed Design Building to comply with the Energy Code. The Standard Design Building is simulated using the same location and having the same characteristics of the Proposed Design Building, but assuming minimal compliance with the Mandatory and Prescriptive requirements applicable to the proposed building, as specified by the Alternative Calculation Methods Approval Manual.
New definitions to support refrigeration measures.	<b>TRANSCRITICAL CO<sub>2</sub> REFRIGERATION SYSTEM</b> is a type of refrigeration system that uses CO <sub>2</sub> as the refrigerant where the ultimate heat rejection to ambient air can take place above the critical point. <b>TRANSCRITICAL MODE</b> is a system operating condition for a refrigeration system wherein the refrigerant pressure and temperature leaving the compressor is such that the refrigerant is at or above the critical point. Typically used in reference to CO <sub>2</sub> refrigeration systems. <b>SUBCRITICAL MODE</b> is a system operating condition for a refrigeration system wherein the refrigerant pressure and temperature leaving the compressor is such that the refrigerant is below the critical point. Typically used in reference to CO <sub>2</sub> refrigeration systems.

<p>New definitions to support ventilation measures.</p>	<p><b>VENTILATION SYSTEM, BALANCED</b> is a mechanical device intended to remove air from buildings, and simultaneously replace it with outdoor air.</p> <p><b>VENTILATION SYSTEM, CENTRAL FAN INTEGRATED (CFI)</b> is a central fan forced air space conditioning system that is also designed to bring outdoor air into buildings, causing indoor air to flow out of the building through ventilation relief outlets or normal leakage paths through the building envelope.</p> <p><b>VENTILATION SYSTEM, ENERGY RECOVERY (ERV)</b> is a mechanical device intended to remove air from buildings, simultaneously replace it with outdoor air and, in the process, transfer heat from the warmer to the colder of the simultaneous airflows, and transfer moisture from the most humid to least humid of the simultaneous airflows.</p> <p><b>VENTILATION SYSTEM, EXHAUST</b> is a mechanical device intended to remove air from buildings, causing outdoor air to enter by ventilation inlets or normal leakage paths through the building envelope.</p> <p><b>VENTILATION SYSTEM, HEAT RECOVERY (HRV)</b> is a mechanical device intended to remove air from buildings, simultaneously replace it with outdoor air and, in the process, transfer heat from the warmer to the colder of the simultaneous airflows.</p> <p><b>VENTILATION SYSTEM, SUPPLY</b> is a mechanical device intended to bring outdoor air into buildings, causing indoor air to flow out of the building through ventilation relief outlets or normal leakage paths through the building envelope.</p>
<p><b>Title 24, Part 6, Section 110.2 – SPACE CONDITIONING EQUIPMENT</b></p>	
<p>Revised efficiency requirements for some Mechanical equipment covered by Title 24, Part 6.</p>	<p>Tables 110.2-A-110.2-D: Minor Changes.</p> <p>Table 110.2-E: Revised Efficiencies.</p> <p>Table 110.2-F: Minor Changes.</p> <p>Table 110.2-G: Revised Efficiencies.</p> <p>Table 110.2-H: Revised Efficiencies.</p> <p>Table 110.2-I: Revised Efficiencies.</p> <p>Table 110.2-J: Minor Changes.</p> <p>Table 110.2-K: Minor Changes.</p>
<p><b>Title 24, Part 6, Section 110.3 – SERVICE WATER-HEATING SYSTEMS AND EQUIPMENT</b></p>	
<p>110.3(a)</p>	<p><b>Certification by Manufacturers:</b> Changes specific to Healthcare.</p>
<p>110.3(b)</p>	<p><b>Efficiency:</b> No Change.</p>
<p>110.3(c)1</p>	<p><b>Outlet Temperature Controls:</b> Systems covered by CA Plumbing Code Section 613.0 for outlet temperature controls must meet those requirements instead of Title 24, Part 6 requirements.</p> <p><b>Temperature controls</b> for public lavatories are no longer limited by Title 24, Part 6.</p>
<p>110.3(c)2-4</p>	<p><b>Water Heating Recirculation Loops / Insulation:</b> No Change.</p>
<p>110.3(c)5</p>	<p><b>Service water heaters in new state buildings</b> shall meet the 60% solar energy/recovered energy requirements of CA Public Resources Code Section 25498.</p>
<p>110.3(c)6</p>	<p><b>Isolation Valves:</b> No Change.</p>
<p><b>Title 24, Part 6, Section 110.4 – POOL AND SPA SYSTEMS AND EQUIPMENT</b></p>	
<p></p>	<p>No Change.</p>
<p><b>Title 24, Part 6, Section 110.5 – NATURAL GAS CENTRAL FURNACES, COOKING EQUIPMENT, AND POOL SPA HEATERS, AND FIREPLACES</b></p>	
<p></p>	<p><b>Pilot Lights Prohibited:</b> Indoor and outdoor fireplaces have been added.</p>
<p><b>Title 24, Part 6, Section 120.0 – GENERAL</b></p>	
<p></p>	<p>No Change.</p>





Title 24, Part 6, Section 120.1 – VENTILATION AND INDOOR AIR QUALITY	
120.1(b)	See "MULTIFAMILY SPECIFIC" section of this Energy Code Ace fact sheet for multifamily ventilation requirements.
<p style="text-align: center;">120.1(c)</p> <p style="text-align: center;">Aligning with ASHRAE 62.1</p> <p style="text-align: center;">EQUATION 120.1-A <math>A_{face} = Q_{filter} / V_{face}</math></p> <p style="text-align: center;">EQUATION 120.1-F <math>V_z = R_g \times A_z</math></p> <p style="text-align: center;">EQUATION 120.1-G <math>V_z = R_p \times P_z</math></p>	<p><b>Nonresidential and Hotel/Motel Buildings:</b> All occupiable spaces shall meet the requirements of subsection 1 and either 2 or 3:</p> <ol style="list-style-type: none"> <li>1. <b>Air Filtration</b> <ol style="list-style-type: none"> <li>A. Mechanical system types that use forced air ducts to supply air to an occupiable space, supply only ventilation systems that provide outside air to an occupiable space and the supply side of mechanical balanced ventilation systems, including heat/energy recovery ventilation systems, shall be provided with air filters to clean the outside and return air prior to its introduction into occupied spaces</li> <li>B. Air Filter Efficiency: MERV 13, or use a particle size efficiency rating specified in the Energy Code AND systems shall be equipped with air filters min. 2" depth or min. 1" if the filter(s) are sized according to Equation 120.1-A, based on a maximum face velocity of 150 ft per minute.</li> </ol> </li> <li>2. <b>Natural Ventilation:</b> Naturally ventilated spaces must ALSO use mechanical UNLESS ventilation openings are permanently open or controlled (controls easily accessible to occupants) to stay open during occupied times. There are specific design criteria to using ceiling height to determine side and corner opening locations used for natural ventilation with minimum openings dependent on floor area.</li> <li>3. <b>Mechanical Ventilation:</b> Occupiable spaces that are served by space conditioning equipment, shall be ventilated with an outdoor airflow rate no less than the larger of Table 120.1-A and/or the number of occupants (EQUATION 120.1-F). If using transfer air, that transfer air must also meet these requirements in addition to the air class requirements of Section 120.1(g).</li> <li>4. <b>Exhaust Ventilation:</b> The design exhaust airflow shall be determined in accordance with the requirements in Table 120.1-D.</li> </ol>
120.1(d)	<p><b>Operation and Control Requirements for Minimum Quantities of Outdoor Air</b></p> <ol style="list-style-type: none"> <li>1. <b>Times of occupancy:</b> Minor Change.</li> <li>2. <b>Pre-occupancy:</b> Minor Change.</li> </ol>
<p style="text-align: center;">Completely revised Table 120.1-A for min. ventilation requirements including DCV airflow rates.</p>	<ol style="list-style-type: none"> <li>3. <b>Required Demand Control Ventilation:</b> Demand ventilation controls complying with 120.1(d)4 (Table 120.1-A) are required for a space with a design occupant density, or a maximum occupant load factor for egress purposes in the CBC, greater than or equal to 25 people/1,000 ft<sup>2</sup> (<math>\leq 40</math> ft<sup>2</sup>/person) if the system serving the space has one or more of the following:             <ol style="list-style-type: none"> <li>A. an air economizer OR</li> <li>B. modulating outside air control OR</li> <li>C. design outdoor airflow rate &gt; 3,000 CFM</li> </ol> <p>EXCEPTIONS: Multiple zones of specific occupancies and healthcare/medical building are no longer exempt. (#1 has been removed.) In #2 a few new space types not served by local exhaust have been added as exempt because of health and safety reasons, including daycare sickrooms, science labs, barber shops and nail salons.</p> </li> <li>4. <b>Demand Control Ventilation Devices:</b> See Table 120.1-A for minimum air rate requirements.</li> </ol>
	<ol style="list-style-type: none"> <li>5. <b>Occupant Sensor Ventilation Control Devices:</b> When occupancy sensor ventilation devices are required by Section 120.2(e)3, which points to Section 130.1(c)5 requirements for offices <math>\leq 250</math> ft<sup>2</sup>, multipurpose rooms &gt;1,000 ft<sup>2</sup>, classrooms of any size, and conference rooms and restrooms of any size, Table 120.1-A allows ventilation to go down to zero when in stand-by mode. This reduces the 30-minute vacancy period requirement but be aware of Section 120.2(e)3 requiring stand-by mode after five minutes of the space being unoccupied. There is no minimum time requirement for the occupancy sensor to reduce airflow when space is not occupied, nor a minimum cycling or operation of outside air while space is vacant. Demand control ventilation no longer is an exception to occupancy sensor controls. TABLE 120.1-A has been completely revised.</li> </ol>
120.1(e)	<b>Ducting for Zonal Heating and Cooling Units:</b> Minor Change.
120.1(f)	<b>Design and Control Requirements for Quantities of Outdoor Air:</b> Minor Change.
<p style="text-align: center;">120.1(g)</p> <p style="text-align: center;">Table 120.1-A</p> <p style="text-align: center;">Table 120.1-B</p> <p style="text-align: center;">Table 120.1-C</p>	<p><b>Air Classification and Recirculation Limitations:</b> Air classification and recirculation limitations must be based on the air classification as listed in Table 120.1-A (which now includes number of occupants or CFM/ft<sup>2</sup>, use whichever is greater) or Table 120.1-C, and in accordance with the requirements of Sections 120.1(g)1-120.1(g)4.</p> <ol style="list-style-type: none"> <li>1. <b>Class 1 Air:</b> Recirculation or transfer of Class 1 air to any space shall be permitted.</li> <li>2. <b>Class 2 Air:</b> Recirculation or transfer of Class 2 air shall be permitted with special requirements to Class 2, Class 3 and Class 4 (but NOT Class 1), with the exception of energy recovery leakage/transfer air, but cannot exceed 10% of outdoor air intake flow when sharing with Class 1.</li> <li>3. <b>Class 3 Air:</b> Recirculation or transfer of Class 3 air shall be permitted within Class 3 only, with the exception of energy recovery leakage/transfer air, but cannot exceed 5% of outdoor air intake flow.</li> <li>4. <b>Class 4 Air:</b> Class 4 air shall not be recirculated or transferred to any space.</li> <li>5. <b>Ancillary spaces:</b> Redesignation of Class 1 air to Class 2 air shall be permitted for Class 1 spaces that are ancillary to Class 2 spaces.</li> <li>6. <b>Transfer:</b> A mixture of air that has been transferred through or returned from spaces or locations with different air classes shall be redesignated with the highest classification among the air classes mixed.</li> <li>7. <b>Classification:</b> See Tables 120.1-A - 120.1-C for expected (or the most similar) air-quality classification of air leaving the space.</li> </ol>

Title 24, Part 6, Section 120.2 – CONTROLS FOR SPACE-CONDITIONING SYSTEMS	
120.2(a)	<b>Thermostatic Controls for Each Zone:</b> No Change.
120.2(b)	<b>Criteria for Zonal Thermostatic Controls:</b> Minor Change.
120.2(c)	<b>Hotel/Motel Guest Room and High-rise Residential Dwelling Unit Thermostats:</b> Meet requirements of Section 110.2(c) instead of Section 150.0.
120.2(e)	<b>Heat Pump Controls:</b> No Change. <b>Shut-off and Reset Controls for Space-conditioning Systems</b> <ol style="list-style-type: none"> <li>1. No Change.</li> <li>2. No Change.</li> </ol>
	<ol style="list-style-type: none"> <li>3. <b>Occupancy Sensing Zone Controls:</b> If a space type has occupancy control requirements (in offices <math>\leq 250</math> ft<sup>2</sup>, multipurpose rooms <math>&lt; 1,000</math> ft<sup>2</sup>, and classrooms, conference rooms and restrooms of any size), then the space will also have occupancy sensor ventilation requirements that turn the ventilation air to "0" AND will reset the thermostat settings (slightly different thermostats requirements when DDC being used) when not occupied for more than five minutes. There is no longer an exception associated with demand control ventilation. Healthcare facilities ARE exempt.</li> </ol>
120.2(f)	<b>Dampers for Air Supply and Exhaust Equipment:</b> Minor Change.
120.2(g)	<b>Isolation Area Devices:</b> Minor Change.
120.2(h)	<b>Automatic Demand Shed Controls:</b> Moved to Section 110.12.
120.2(i)	<b>Economizer Fault Detection and Diagnostics (FDD):</b> Applies to all air handlers with mechanical cooling having a capacity $> 54,000$ Btuh.
120.2(j)	<b>Direct Digital Controls (DDC):</b> Minor Change.
120.2(k)	<b>Optimum Start/Stop Controls:</b> New exception for systems that operate continuously.
Title 24, Part 6, Section 120.3 – PIPE INSULATION	
120.3(a)	<b>General Requirements:</b> Minor Changes AND Fluid distribution systems include all elements that are in series with the fluid flow but do not include elements that are not in series with the fluid flow.
120.3(b)	<b>Insulation Protection:</b> Minor Change.
120.3(c)	<b>Insulation Thickness:</b> Table 120.3-A revised to support insulation thickness in alignment with CA Plumbing Code.
Title 24, Part 6, Section 120.4 – AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS	
	Minor Changes.
Title 24, Part 6, Section 120.5 – MECHANICAL SYSTEM ACCEPTANCE	
	Occupancy sensing zone controls acceptance testing has been added.
<b>T24 Section &amp; Notes</b>	 <b>Prescriptive – Change Summaries</b>
Title 24, Part 6, Section 140.4 – SPACE CONDITIONING SYSTEMS	
140.4(a)	<b>Sizing and Equipment Selection:</b> Minor Change.
140.4(b)	<b>Calculations:</b> High-Rise multifamily, hotel/motel and nonresidential buildings must use the 2017 ASHRAE Handbook – Fundamentals or Energy Commission-approved method. Otherwise, only minor changes.
140.4(c)	<b>Fan Systems:</b> Each fan system having a total fan system motor nameplate horsepower exceeding 5 hp used for space conditioning must meet the requirements of Items 1, 2 and 3. <ol style="list-style-type: none"> <li>1. <b>Fan Power Limitation:</b> Per Table 140.4-A and Table 140.4-B, new formulas for calculating allowed fan power.</li> <li>2. <b>Variable Air Volume (VAV) System:</b> Fan power limit of 1.25 watts per CFM of supply air when fan system greater than 25 hp AND the fan power treatment/filter adjustment have been removed. Otherwise, only minor changes.</li> <li>3. <b>Fractional HVAC Motors for Fans:</b> Minor Change.</li> </ol>
140.4(d)	<b>Space-conditioning Zone Controls:</b> Minor Change.
140.4(e)	<b>Economizers:</b> New chilled water cooling system requirements have been added with a new Table 140.4-C "Chilled Water System Cooling Capacity." Max. pressure drop and integrated partial cooling controls added. New EXCEPTION to economizers for systems designed to operate with 100% outside air all the time. Otherwise, only minor changes.
140.4(f)	<b>Supply Air Temperature Reset Controls:</b> Minor Change.
140.4(g)	<b>Electric Resistance Heating:</b> Revisions to EXCEPTION 5 making it no longer required to have the utility deem a gas line extension to be impractical. Exception added for emergency backup systems.

140.4(h)	<p><b>Heat Rejection Systems:</b> There are new requirements for cooling tower efficiency.</p> <p><b>Cooling Tower Efficiency:</b> Axial fan, open-circuit cooling towers serving condenser water loops for chilled water plants with a total of 900 gpm or greater must have a rated efficiency of no less than 60 gpm/hp when rated in accordance with the conditions as listed in Table 110.2-G.</p> <p>EXCEPTION 1 to Section 140.4(h)5: Replacement of existing cooling towers that are inside an existing building or on an existing roof.</p> <p>EXCEPTION 2 to Section 140.4(h)5: Cooling towers serving buildings in Climate Zone 1 or 16.</p>
140.4(i)-(m)	No Change.
140.4(n)	<b>Mechanical System Shut-off:</b> New EXCEPTION for high-rise multifamily dwelling units.
140.4(o)	<p><b>Exhaust System Transfer Air:</b> Conditioned supply air delivered to any space with mechanical exhaust shall not exceed the greater of:</p> <ol style="list-style-type: none"> <li>1. The supply flow required to meet the space heating or cooling load; or</li> <li>2. The ventilation rate required by the authority having jurisdiction, the facility Environmental Health and Safety Department, or by Section 120.1(c)3; or</li> <li>3. The mechanical exhaust flow minus the available transfer air. Available transfer air must be from another conditioned space or return air plenums on the same floor and same smoke or fire compartment, and are within 15 feet of each other at their closest point.</li> </ol> <p>EXCEPTION 1 to Section 140.4(o): Biosafety level classified laboratories 3 or higher.</p> <p>EXCEPTION 2 to Section 140.4(o): Vivarium spaces.</p> <p>EXCEPTION 3 to Section 140.4(o): Spaces that are required by applicable codes and standards to be maintained at a positive pressure differential relative to adjacent spaces.</p> <p>EXCEPTION 4 to Section 140.4(o): Spaces where the highest amount of transfer air that could be used for exhaust makeup may exceed the available transfer airflow rate and where the spaces have a required negative pressure relationship.</p> <p>EXCEPTION 5 to Section 140.4(o): Healthcare facilities.</p>
<b>Title 24, Part 6, Section 140.5 – SERVICE WATER HEATING SYSTEMS</b>	
140.5(a)	<b>Nonresidential Occupancies:</b> No Change.
<b>Title 24, Part 6, Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS</b>	
141.0(a)	<b>Additions:</b> Minor Changes.
141.0(b) Table 141.0-D	<p><b>Alterations</b></p> <ol style="list-style-type: none"> <li>1. <b>Mandatory Requirements:</b> No Change.</li> <li>2. <b>Prescriptive Approach</b> <ol style="list-style-type: none"> <li>C. <b>New or Replacement Space-Conditioning Systems or Components:</b> New allowance for additional fan power adjustment credits to Section 140.4(c)1 using Table 141.0-D.</li> <li>D. <b>Altered Duct Systems:</b> Minor Changes.</li> <li>E. <b>Altered Space-Conditioning Systems:</b> See Section 110.12 for demand responsive control requirements.</li> </ol> </li> <li>3. <b>Performance Approach:</b> New EXCEPTION in which Section 120.2(i) (Economizer FDD) shall not apply to alterations to HVAC systems or components. Otherwise, only minor changes.</li> </ol>
141.0(b)3	

# COVERED PROCESS


Color background indicates:  NO CHANGE/MINOR CHANGE  REVISED  NEW FOR 2019

Building Application	 <b>Mandatory</b>			 <b>Prescriptive</b>	 <b>Performance</b>	 <b>Additions Alterations</b>
	All Occupancy Subchapters 1-2 (§§100.0-110.11)	Nonresidential Occupancy Subchapter 3 (§§120.0-120.9)	Nonresidential Lighting/ELP Subchapter 4 (§§130.0-130.5)	Subchapter 5 (§§140.0-140.9)	Subchapter 5 (§§140.0-140.1)	Subchapter 6 (§§141.0-141.1)
Envelope, Ventilation, Process Loads	§110.2	§120.6	N/A	§140.9	§140.1	§§120.6, 140.9, 141.1

**T24 Section & Notes**  **Mandatory – Change Summaries**





Title 24, Part 6, Section 120.6 – COVERED PROCESSES	
120.6(a)1-3	<b>Refrigerated Warehouses:</b> Refrigerated spaces with a sum total of 3,000 ft <sup>2</sup> or more that are served by the same refrigeration system must meet all of the requirements of Section 120.6(a).
120.6(a)4	<b>Condensers:</b> Adiabatic chiller requirements included.
New Table 120.6-B Min. Efficiency. Adiabatic Dry Mode	<p>A. <b>Design Saturated Condensing Temperatures:</b> No Change.</p> <p>B. <b>Design Saturated Condensing Temperatures:</b> No Change.</p> <p>C. The <b>saturated condensing temperature</b> necessary for adiabatic condensers to reject the design total heat of rejection of a refrigeration system assuming dry mode performance must be less than or equal to:</p> <ul style="list-style-type: none"> <li>i. The design drybulb temperature plus 20°F for systems serving freezers</li> <li>ii. The design drybulb temperature plus 30°F for systems serving coolers</li> </ul> <p>EXCEPTION 1 to Section 120.6(a)4C: Compressors and condensers on a refrigeration system for which more than 20% of the total design refrigeration cooling load is for quick chilling or freezing, or process refrigeration cooling for other than a refrigerated space.</p> <p>D. <b>All condenser fans</b> for air-cooled condensers, evaporative-cooled condensers, adiabatic condensers, gas coolers, air or water fluid coolers or cooling towers must be continuously variable speed, with the speed of all fans serving a common condenser high side controlled in unison.</p> <p>E. <b>Min. Condensing Setpoint:</b> 70°F for systems stated above.</p> <p>F. <b>Condensing Temperature Reset:</b> Allowances added for adiabatic condensers including EXCEPTIONS to reset controls in CZ 1, 3, 5, 12, 14 and 16.</p> <p>G. <b>Condenser Efficiency:</b> New EXCEPTION for adiabatic condensers with ammonia as refrigerant. New EXCEPTION for transcritical CO<sub>2</sub> refrigeration systems for all of the above EXCEPT D and E.</p>
	120.6(a)6
120.6(a)7	<b>Refrigeration System Acceptance:</b> Adiabatic condensers added.
120.6(b)	<b>Commercial Refrigeration:</b> Trigger for remote compressor and condensing units removed. Added language for adiabatic condensers and gas coolers with some new EXCEPTIONS for transcritical CO <sub>2</sub> refrigeration systems.
120.6(c)	<b>Enclosed Parking Garages:</b> No Change.
120.6(d)	<b>Process Boilers:</b> No Change.
120.6(e)	<b>Compressed Air Systems:</b> No Change.
120.6(f)	<b>Elevators:</b> New EXCEPTION excluding interior signal and display lighting from calculation of lighting power density.
120.6(g)	<b>Escalators and Moving Walkways:</b> No Change.
Title 24, Part 6, Section 120.9 – COMMERCIAL BOILERS	
	No Change.



T24 Section & Notes		 <b>Prescriptive – Change Summaries</b>					
<b>Title 24, Part 6, Section 140.0 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES</b>							
	No Change.						
<b>Title 24, Part 6, Section 140.9 – COVERED PROCESSES</b>							
140.9(a)	<b>Computer Rooms:</b> Minor Changes.						
	1. <b>Economizers:</b> If an air economizer is used, FDD per Section 120.2(i) has been added.						
140.9(b)	<b>Commercial Kitchens:</b> Minor Changes.						
140.9(c)	<b>Laboratory and Factory Exhaust Systems</b>						
	1. <b>Airflow Reduction Requirements:</b> No Change.						
	2. <b>Exhaust System Transfer Air:</b> Conditioned supply air delivered to any space with mechanical exhaust must comply with the requirements of Subsection 140.4(o).						
	3. <b>Fan System Power Consumption:</b> All newly installed fan exhaust systems serving a laboratory or factory greater than 10,000 CFM must meet requirements of Subsection A and either B, C or D.						
	A. Systems discharge per ANSI Z9.5-2012. B. The exhaust fan system power must not exceed 0.85 w/CFM of exhaust air for systems with air filtration, scrubbers or other air treatment devices. For all other exhaust fan systems, the system power must not exceed 0.65 w/CFM of exhaust air. Exceptions may apply. C. The volume flow rate at the stack must vary based on the measured 5-minute averaged wind speed and wind direction obtained from a calibrated local anemometer. Acceptance testing is required. D. The volume flow rate at the stack must vary based on the measured contaminant concentration in the exhaust plenum from a calibrated contaminant sensor installed within each exhaust plenum. Acceptance testing is required.						
	4. <b>Fume Hood Automatic Sash Closure:</b> Variable air volume laboratory fume hoods with vertical only sashes located in fume hood intensive laboratories, as described in Table 140.9-B, must have an automatic sash closure system meeting specific requirements including acceptance testing.						
This is a brief overview, make sure to look at code language for requirements in their entirety.  Table 140.9-B	<b>Table 140.9-B Fume Hood Intensive Laboratories</b>						
	<b>Occupied Minimum Ventilation ACH</b>	<b>≤ 4</b>	<b>&gt; 4 and ≤ 6</b>	<b>&gt; 6 and ≤ 8</b>	<b>&gt; 8 and ≤ 10</b>	<b>&gt; 10 and ≤ 12</b>	<b>&gt; 12 and ≤ 14</b>
	Hood Density (linear feet per 10,000 <sup>3</sup> of laboratory space)	≥ 6	≥ 8	≥ 10	≥ 12	≥ 14	≥ 16
<b>Title 24, Part 6, Section 141.1 – ADDITIONS, ALTERATIONS</b>							
	<b>Lab and Process Facility Exhaust Systems:</b> All newly installed fan systems for a laboratory or process facility exhaust system greater than 10,000 CFM must meet the requirements of Section 140.9(c). Otherwise, no change.						

# ENVELOPE & SOLAR READY

Color background indicates:  NO CHANGE/MINOR CHANGE  REVISED  NEW FOR 2019

Building Application	 <b>Mandatory</b>			 <b>Prescriptive</b>	 <b>Performance</b>	 <b>Additions Alterations</b>
	All Occupancy Subchapters 1-2 (§§100.0-110.11)	Nonresidential Occupancy Subchapter 3 (§§120.0-120.9)	Nonresidential Lighting/ELP Subchapter 4 (§§130.0-130.5)	Subchapter 5 (§§140.0-140.9)	Subchapter 5 (§§140.0-140.1)	Subchapter 6 (§§141.0-141.1)
General	§§100.0, 100.1-2, 110.0, 110.1	§120.0	N/A	§§140, 140.2		
Envelope (conditioned)	§§110.6, 110.7, 110.8	§120.7	N/A	§140.3	§§140.0, 140.1	§141.0
Envelope (unconditioned, process spaces)	N/A			§140.3(c)		

**T24 Section & Notes**



**Mandatory – Change Summaries**

**Title 24, Part 6, Section 100.1 – DEFINITIONS**

Updates to various references to resources and standards other than the Energy Code (e.g., revisions to list newer applicable versions or editions).

To support new Lighting Power Adjustment Factor (PAF)

**CLERESTORY** is fenestration installed above a roofline  $\geq 60$  degrees from the horizontal, or any portion of exterior vertical glazing  $\geq 8$  feet per floor above the finished floor of a space.  
**HORIZONTAL SLATS**, when referring to a daylighting device, is a set of adjacent surfaces located directly adjacent to vertical fenestration, oriented horizontally and projecting horizontally from its interior or exterior vertical surface.  
**LIGHT SHELF** is an adjacent, opaque surfaced daylighting device located at the sill of clerestory glazing, oriented horizontally and projecting horizontally from an interior or exterior vertical surface.  
**SKYLIGHT ROOF RATIO (SRR)** is the ratio of the skylight area to the gross exterior roof area.  
**VERTICAL FENESTRATION** is all fenestration other than skylights and doors.  
**VISIBLE REFLECTANCE** is the reflectance of light at wavelengths from 410 to 722 nanometers.  
**OVERHANG PROJECTION** is the horizontal distance, measured outward horizontally from the surface of exposed exterior glazing at the head of a window to the outward edge of an overhang.  
**OVERHANG RISE** is the vertical distance between the projected edge of an overhang and the sill of the vertical fenestration below it.

Revised definition to the “baseline” building used in Performance software.

**STANDARD DESIGN BUILDING** is a building that is automatically simulated by Commission-approved compliance software to establish the Energy Budget that is the maximum energy consumption allowed by a Proposed Design Building to comply with the Energy Code. The Standard Design Building is simulated using the same location and having the same characteristics of the Proposed Design Building, but assuming minimal compliance with the Mandatory and Prescriptive requirements applicable to the proposed building, as specified by the Alternative Calculation Methods Approval Manual.

**Title 24, Part 6, Section 110.6 – FENESTRATION PRODUCTS AND EXTERIOR DOORS**


110.6(a)1	<b>Air leakage:</b> Minor Changes.
110.6(a)2	<b>U-factor:</b> EXCEPTION 1 has dropped the max. allowed square footage for the Reference Nonresidential Appendix NA6 COG formula to 200 ft <sup>2</sup> .
110.6(a)3	<b>SHGC:</b> EXCEPTION 1 has dropped the max. allowed square footage for the Reference Nonresidential Appendix NA6 COG formula to 200 ft <sup>2</sup> .
110.6(a)4	<b>VT:</b> EXCEPTION 1 has dropped the max. allowed square footage for the Reference Nonresidential Appendix NA6 COG formula to 200 ft <sup>2</sup> .
110.6(b)	<b>Installation of Field-fabricated Fenestration and Exterior Doors:</b> No Change.
Tables 110.6-A & B	<b>Default Fenestration U-factors and SHGC:</b> No Change.

**Title 24, Part 6, Section 110.7 – LIMIT AIR LEAKAGE**

No Change.

**Title 24, Part 6, Section 110.8 – INSULATION, ROOFING PRODUCTS AND RADIANT BARRIERS**





Minor Changes.

Title 24, Part 6, Section 110.10 – SOLAR READY BUILDINGS	
110.10(a)3	Minor Changes.
110.10(a)4	Minor Changes.
110.10(b)1B	Solar Zone EXCEPTION 3 potential solar zone annual solar access has been changed for steep-sloped roofs oriented 90°- 300° of true north (was 110°- 300°). EXCEPTION 4 for multifamily buildings has been revised to apply when a demand response thermostat AND A. Options i, ii and iii: No Change. B. NEW option: OR meet the Title 24, Part 11, Section A4.106.8.2 requirements for EV charging spaces.
110.10(b)2	<b>Azimuth:</b> All sections of the solar zone located on steep-sloped roofs must be oriented 90°- 300° of true north.
110.10(b)3-4	No Change.
110.10(c)-(e)	Minor Changes.
Title 24, Part 6, Section 120.7 – INSULATION REQUIREMENTS	
	Minor Changes.
<b>T24 Section &amp; Notes</b>	 <b>Prescriptive – Change Summaries</b>
Title 24, Part 6, Section 140.0 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES	
	No Change.
Title 24, Part 6, Section 140.2 – PRESCRIPTIVE APPROACH	
	Minor Changes.
Title 24, Part 6, Section 140.3 – BUILDING ENVELOPES	
140.3(a)	<b>Envelope Component Requirements</b> 1. <b>Exterior Roofs and Ceilings:</b> Minor Changes. 2. <b>Exterior Walls:</b> No Change. 3. <b>Demising Walls:</b> Vertical windows to meet the U-factor requirements only. 4. <b>Exterior Floors and Soffits:</b> No Change. 5. <b>Vertical Exterior Windows in Exterior Walls:</b> Minor Changes. 6. <b>Skylights:</b> Table 140.3-B added Tubular Daylighting Devices (TDD) with a U-factor = 0.88; SHGC = NR; VT = 0.38. 7. <b>Exterior Doors:</b> No Change. 8. <b>Relocatable Public School Buildings:</b> No Change. 9. <b>Air Barrier:</b> Minor Changes.
140.3(b)(c)	<b>Minimum Daylighting Requirement for Large Enclosed Spaces:</b> No Change.
140.3(d)	<b>Daylighting Design Power Adjustment Factor (PAF):</b> Clerestory fenestration, interior/exterior horizontal slats and interior/exterior light shelves have been added as measures that can be used as a PAF for indoor lighting.
Title 24, Part 6, Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS	
	<b>Alterations</b> 1. <b>Mandatory Requirements:</b> Minor Changes. 2. <b>Prescriptive Approach</b> A. <b>Fenestration:</b> New NOTE: Glass replaced in an existing sash and frame or sashes replaced in an existing frame are considered repairs. In these cases, Section 141.0(c) requires that the replacement be at least equivalent to the original in performance. B. <b>Roofs:</b> No Change. O. <b>Interior Walls/Ceiling for First Time:</b> No Change.

# ELECTRICAL

- Lighting: Indoor, Outdoor and Signs
- Demand Management
- Electrical Distribution

Color background indicates:  NO CHANGE/MINOR CHANGE  REVISED  NEW FOR 2019

Building Application	 <b>Mandatory</b>			 <b>Prescriptive</b>	 <b>Performance</b>	 <b>Additions Alterations</b>
	All Occupancy Subchapters 1-2 (§§100.0-110.11)	Nonresidential Occupancy Subchapter 3 (§§120.0-120.9)	Nonresidential Lighting/EPD Subchapter 4 (§§130.0-130.5)	Subchapter 5 (§§140.0-140.9)	Subchapter 5 (§§140.0-140.1)	Subchapter 6 (§§141.0-141.1)
General	§§100.0, 100.1-2, 110.0, 110.1, 110.12(c)	§120.0	N/A	§§140, 140.2	§§140.0, 140.1	§141.0
Indoor Lighting (conditioned, process spaces)	§110.9	§120.8	§§130.0, 130.1, 130.4	§§140.3(c), 140.6		
Indoor Lighting (unconditioned, parking garages)	§110.9	N/A	§§130.0, 130.1, 130.4	§§140.3(c), 140.6	N/A	
Outdoor Lighting	§110.9	N/A	§§130.0, 130.1, 130.4	§140.7		
Signs (Indoor and Outdoor)	§110.9	N/A	§§130.0, 130.3	§140.8	N/A	§§141.0, 141.0(b)(2)H

**T24 Section & Notes**



**Mandatory – Change Summaries**

**Title 24, Part 1, Section 10-103 – PERMIT, CERTIFICATE, INFORMATIONAL, AND ENFORCEMENT REQUIREMENTS FOR DESIGNERS, INSTALLERS, BUILDERS, MANUFACTURERS, AND SUPPLIERS**

10-103.1  
10-103.2

**Nonresidential Acceptance Test Training and Certification:** Changes to how ATTCPs (acceptance test technician certification providers) recertify ATTs (acceptance test technicians) and ATEs (acceptance test employers), and how to deal with those “decertified” by an ATTCP. Quality assurance procedures and reporting have been revised.

**Title 24, Part 1, Section 10-106 – LOCALLY ADOPTED ENERGY STANDARDS**

10-106

Clarification that cost-effectiveness studies submitted as part of applications from public agencies for the adoption of local energy codes must first be made available for public review within the jurisdiction of the public entity, then the Energy Commission must confirm that the cost-effectiveness study demonstrates that the proposed new local code will use less energy than what is permitted by Title 24, Part 6. Only then may it be filed with the Energy Commission.

**Title 24, Part 6, Section 100.0 – SCOPE**

100.0(h)

Clarification that if manufactured equipment, a product or device is NOT specified in Title 24, Part 6, it will be in Title 20 Sections 1601-1609.

**Title 24, Part 6, Section 100.1 – DEFINITIONS**

Updates to various references to resources and standards other than the Energy Code (e.g., revisions to list newer applicable versions or editions).

**DEMAND FLEXIBILITY MEASURE** is a measure that reduces TDV energy consumption using communication and control technology to shift electricity use across hours of the day to decrease energy use onpeak or increase energy use offpeak, including but not limited to battery storage, or HVAC or water heating load shifting.

**DEMAND RESPONSE SIGNAL** is a signal that indicates a price or a request to modify electricity consumption for a limited time period.

**DEMAND RESPONSIVE CONTROL** is an automatic control that is capable of receiving and automatically responding to a demand response signal.


**ENERGY MANAGEMENT CONTROL SYSTEM (EMCS)** is an automated control system that regulates the energy consumption of a building by controlling the operation of energy consuming systems, and is capable of monitoring loads and adjusting operations in order to optimize energy usage and respond to demand response signals

Cleaned up and added to support lighting.

	<p><b>FACTORY</b> is a building, structure or space designated as Factory Group F that is used for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations.</p>
	<p><b>LIGHTING:</b></p> <p><b>LAMP</b> is an electrical appliance that produces optical radiation for the purpose of visual illumination, designed with a base to provide an electrical connection between the lamp and a luminaire. A lamp is not a luminaire nor an LED retrofit kit.</p>
	<p><b>LED RETROFIT KIT</b> is a solid state lighting product intended to replace existing light sources and systems, including incandescent and fluorescent light sources, in previously installed luminaires that already comply with safety standards. These kits replace the existing light source and related electrical components, and are classified or certified to UL 1598C. They may employ an ANSI standard lamp base, either integral or connected to the retrofit by wire leads. LED retrofit kit does not include self-ballasted lamps.</p> <p><b>NON-INTEGRATED LED LAMP</b> is an assembly composed of an LED array (module) or LED packages (components), and an ANSI standard base. The device is intended to connect to the LED driver of an LED luminaire through an ANSI standard lamp-holder (socket). The device cannot be connected directly to the branch circuit. (ANSI/IES RP-16-17)</p> <p><b>INTEGRATED LED LAMP</b> is an integrated assembly composed of LED packages (components) or LED arrays (modules), as well as an LED driver, an ANSI standard base, and other optical, thermal, mechanical and electrical components. The device is intended to connect directly to the branch circuit through a corresponding ANSI standard lamp-holder (socket). (ANSI/IES RP-16-17)</p>
	<p><b>NARROW BAND SPECTRUM</b> is a limited range of wavelengths (nm) concentric to a dominant peak wavelength in the visible spectrum. The limited range of wavelength must be within 20 nm on either side of the peak wavelength at 50% of the peak wavelength's relative spectral power, and within 75 nm on either side of the peak wavelength at 10% of the peak wavelength's relative spectral power.</p> <p><b>SOLID STATE LIGHTING (SSL)</b> is a family of light sources that includes semiconductor LEDs and organic LEDs (OLED).</p> <p><b>DRIVER</b> when used in relation to solid state lighting, is a device that uses semiconductors to control and supply DC power for LED starting and operation.</p> <p><b>Various lighting control definitions cleaned up</b></p> <p><b>OPENADR 2.0a</b> is the OpenADR Alliance document, "OpenADR 2.0 Profile Specification A Profile," published 2011.</p> <p><b>OPENADR 2.0b</b> is the OpenADR Alliance document, "OpenADR 2.0 Profile Specification B Profile," published 2015.</p> <p><b>VIRTUAL END NODE (VEN)</b> is an interface with a demand responsive control system that accepts signals transmitted through OpenADR, consistent with the specifications in OpenADR 2.0a or 2.0b</p>
<b>Title 24, Part 6, Section 110.9 – LIGHTING CONTROLS</b>	
110.9(a)	<p>All lighting control devices and systems, and all light sources subject to the requirements of Section 110.9 must meet the following requirements:</p> <ol style="list-style-type: none"> <li>Lighting controls consist of individual devices AND systems (two or more lighting control components).</li> <li>Must meet lighting control installation requirements of Section 130.4. Removed: Self-contained lighting controls no longer need to be Title 20-certified.</li> </ol>
110.9(b)	<p><b>Lighting Controls</b></p> <ol style="list-style-type: none"> <li><b>Time-Switch:</b> All controls that provide time-switch functionality must have program backup capabilities including date, time AND: <ol style="list-style-type: none"> <li><b>Time-Switch Installed:</b> Must have a 2-hour override and holiday shutoff feature. No longer needs to be Title 20-certified since those requirements were moved to Title 24, Part 6.</li> <li><b>Astronomical Time-Switch Installed:</b> Must have sunrise and sunset prediction and timekeeping accuracy and display dates and times for programming, adjusting for daylight savings time and allow each channel to be programmed independently. No longer needs to be Title 20 certified since those requirements were moved to Title 24, Part 6.</li> <li><b>Multi-Level Time Switch Controls:</b> Must have at least 2 separate steps per zone.</li> </ol> </li> <li><b>Time-Switch Controls Installed Outdoors:</b> Minor Changes.</li> <li><b>Daylighting Controls:</b> Controls that provide automatic daylighting functionality must meet specific setting, calibration and accuracy requirements.</li> <li><b>Dimmers:</b> Controls that provide dimming functionality must have power consumption minimums and reduced flicker operation, and be able to reduce "0" lumen output with special requirements for 3-way circuits.</li> <li><b>Occupant Sensing Controls:</b> Occupant sensing controls include occupant sensors, motion sensors and vacancy sensors, including those with a Partial-ON or Partial-OFF function. Occupant sensing controls must have min. time functions, grace period and visible status signals. Exceptions apply to controls that combine functions if they cannot be changed by occupants to override required features.</li> <li><b>Part-Night Outdoor Lighting Controls:</b> Must have sunrise and sunset prediction using both light sensing and time measurement; and the ability to reduce or turn off outdoor luminaire power at night as required in Section 130.2(c); and to be programmable to engage reduced/off functionality during the night.</li> <li><b>Sensors Used to Detect Occupants:</b> Sensors that are used by occupant sensing controls to detect occupants cannot be easily disabled and have special requirements if using ultrasonic (see Table 110.9-A) or microwave radiation.</li> <li><b>Indicator Lights:</b> Indicator lights integral to lighting controls must not consume more than 1W/indicator light.</li> </ol>
	<p>New: Table 110.9-A Ultrasound Max. Decibel Values</p>

110.9(c)	<b>Track Lighting Integral Current Limiter:</b> No longer has special requirements outlined in Sections 110.9(c)1-3 of the 2016 Energy Code, such as being Title 20-certified, verified through Acceptance Testing by an ATT and tamper resistant. Note that there are now ONLY subsections 1-3.
110.9(c)1-3	<b>Renumbered from 110.9(c)6-8:</b> No Change (other than renumbering).
110.9(d)	<b>Track Lighting Supplementary Overcurrent Protection Panel:</b> Cleanup of the requirements. <ul style="list-style-type: none"> <li>1. Must be listed as defined in Section 100.1 AND</li> <li>2. Must have a permanently installed label that is prominently located and uses language specified in Section 110.9(d)2.</li> </ul>
<b>Title 24, Part 6, Section 110.11 – ELECTRICAL POWER DISTRIBUTION SYSTEM</b>	
	No Change.
<b>Title 24, Part 6, Section 110.12 – DEMAND MANAGEMENT</b>	
110.12(a)	<b>Demand Responsive Controls</b> <ul style="list-style-type: none"> <li>1. All demand responsive controls must be either: <ul style="list-style-type: none"> <li>A. Capable of functioning as a certified OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN), as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification OR</li> <li>B. Certified by the manufacturer as being capable of responding to a demand response signal from a certified OpenADR 2.0b VEN by automatically implementing the control functions requested by the VEN for the equipment it controls.</li> </ul> </li> <li>2. All demand responsive controls must be capable of communicating using one or more of the following for communications that occur within the building: Wi-Fi, ZigBee, BACnet, Ethernet or hard-wiring.</li> <li>3. Demand responsive controls may incorporate and use additional protocols beyond those specified in Sections 110.12(a)1 and 2.</li> <li>4. When communications are disabled or unavailable, all demand responsive controls must continue to perform all other control functions provided by the control.</li> <li>5. Demand responsive control thermostats must comply with Reference Joint Appendix 5 (JA5), Technical Specifications For Occupant Controlled Smart Thermostats.</li> </ul>
110.12(b)	<b>Demand Responsive Zonal HVAC Controls:</b> Minor Changes.
110.12(c)	<b>Demand Responsive Lighting Controls:</b> Minor Changes.
110.12(d)	<b>Demand Responsive Electronic Message Center Control:</b> Minor Changes.
<b>Title 24, Part 6, Section 130.0 – LIGHTING SYSTEMS AND EQUIPMENT, AND ELECTRICAL POWER DISTRIBUTION SYSTEMS</b>	
130.0(a)	<b>Scope:</b> No Change.
130.0(b)	<b>Functional Areas Where Compliance with Residential Lighting Standards is Required:</b> Minor Changes.
130.0(c)1	<b>Luminaire Classification and Power:</b> Minor Change.
130.0(c)2	<b>Wattage of Non-permanently Installed Ballasts or Transformers:</b> Must be the max. rated wattage of luminaire and, for recessed luminaires with line-voltage medium screw base sockets, you can choose 50 watts OR the rated wattage of a Reference Joint Appendix 8 (JA8)-compliant lamp.
130.0(c)3	<b>Incandescent:</b> Language removed.
130.0(c)4	<b>Lamp/ballast Combinations:</b> Input wattage per UL1598.
130.0(c)5	<b>Inseparable and Remote Driver SSL Luminaires Max:</b> Input wattage per UL1598,2108, 8750 or IES LM-79.
130.0(c)5	<b>LED Tape and Linear Lighting Max:</b> Input wattage to be length times rated power density wattage OR max. rated input wattage of driver/power supply when tested per UL 2108, 8750 or IES LM-79.
130.0(c)	<b>Modular Lighting Systems That Can Be Added or Relocated Without Rewiring:</b> Input wattage must be <ul style="list-style-type: none"> <li>A. 30W/linear foot of track/plug-in busway OR rated wattage of ALL the luminaires in the system per 130.0(c)1; OR</li> <li>B. When using current limiter/supplementary overcurrent protection panel, volt-ampere rating of current limiter OR sum of ampere rating of all devices times branch circuit voltage of all panels.</li> <li>C. When powered by a driver, power supply or transformer, <b>max.</b> rated input per manufacturer’s catalogs (per UL2108 or 8750).</li> </ul> <p>EXCEPTION to modular lighting requirements: If power-over-Ethernet system, non-lighting devices can be subtracted from max. rated input power.</p>
130.0(c)7	<b>Anything Not Addressed by Sections 130.0(c)1-6:</b> Wattage must be <b>max</b> labeled rated input.
130.0(d)	<b>Lighting Controls:</b> Minor Changes.
130.0(e)	<b>Energy Management Control System (EMCS):</b> Minor Changes.

Title 24, Part 6, Section 130.1 – INDOOR LIGHTING CONTROLS	
130.1(a)	<b>Manual Area Controls:</b> Minor Changes.
130.1(b)	<b>Multi-Level Lighting Controls:</b> New EXCEPTION added for restrooms. The classroom exception has been removed.
130.1(c)	<b>Shut-OFF Controls:</b> Must be able to reduce lighting. Partial-off controls configured to provide the min. lighting as required for egress in CA Building Code Section 1008. New occupancy sensor requirements for bathrooms.
130.1(d)	<b>Automatic Daylighting Controls:</b> Clean up of how atria skylit/daylit areas must be defined. If multi-level controls are required, the auto daylighting must be done using continuous dimming. New requirements about accessibility of sensors. Clean up of exceptions and some new ones: EXCEPTION 1: If existing structures or objects block the sunlight through a skylight for more than 1,500 daytime hours per year 8 am – 4 pm. EXCEPTION 2: If an overhang covers the entire vertical fenestration, and there is no fenestration above the overhang, and the ratio of overhang rise is > 1.5 for south, east and west orientations, and > 1 for north orientations. EXCEPTIONS 3-5: No change to < 120W in primary/skylit zones, parking garages ≤ 60W, 24 ft <sup>2</sup> glazing/36 ft <sup>2</sup> for garage, and parking garage adaption/dedicated ramps. EXCEPTION 6: Sidelit zones in retail merchandise sales and wholesale showroom areas.
130.1(e)	<b>Demand Responsive Controls:</b> Moved to Section 110.12
130.1(f)	<b>Control Interactions:</b> New language on how controls should interact with each other without limiting the control requirements of Sections 130.1 and 110.12.
Title 24, Part 6, Section 130.2 – OUTDOOR LIGHTING CONTROLS AND EQUIPMENT	
130.2(a)	<b>REMOVED:</b> Motion sensor requirement for incandescent lighting over 100 watts.
130.2(b)	<b>Luminaire Cutoff Requirements:</b> Trigger is now lumens (not wattage): ≥ 6,200 initial lumens, and then all of the BUG requirements of Title 24, Part 11, Section 5.106.8 must be met. New EXCEPTION for luminaires attached to multifamily/hotel/motel building and controlled from <i>within</i> the dwelling unit/hotel room.
130.2(c)	<b>Controls for Outdoor Lighting</b> 1. <b>Daylight Availability:</b> Minor Changes. 2. <b>Automatic Scheduling Controls:</b> Must be able to reduce outdoor lighting power 50%-90%, turn the lighting off during unoccupied times and have at least two scheduling options for each luminaire independent from each other and with a 2-hour override function. Acceptance testing required. May be combined with other controls, if applicable. 3. <b>Motion Sensing Controls:</b> Must be able to reduce outdoor lighting power 50%-90% and turn the lighting off during unoccupied times. Must have the ability to reduce power within 15 minutes of area being vacant and be able to come back on again when occupied 1,500 or less luminaire wattage controlled by a single sensor. Required for Building Façade, Ornamental Hardscape, Outdoor Dining, Outdoor Sales Frontage if using bilaterally symmetric luminaires) and within 24 feet of grade. EXCEPTION 1: If any outdoor luminaire (e.g., pole light, wall pack and linear lighting) has a max. rated wattage of ≤ 40W. EXCEPTION 2: No Change. EXCEPTION 3: Lighting subject to a health or life safety statute, ordinance, or regulation may have a minimum time-out period longer than 15 minutes or a minimum dimming level above 50% when necessary to comply with the applicable law.
Title 24, Part 6, Section 130.3 – SIGN LIGHTING CONTROLS	
	Demand response EMC moved to Section 110.12.
Title 24, Part 6, Section 130.4 – LIGHTING CONTROL ACCEPTANCE/ INSTALLATION CERTIFICATE	
130.4(a)	<b>Lighting Control Acceptance Requirements:</b> No Change.
130.4(b)	<b>Lighting Control Installation Certificate Requirements:</b> Track lighting no longer has special installation nor acceptance testing requirements.
Title 24, Part 6, Section 130.5 – ELECTRICAL POWER DISTRIBUTION SYSTEMS	
130.5(a)	<b>Service Electrical Metering:</b> No Change.
130.5(b)	<b>Separation of Electrical Circuits for Electrical Energy Monitoring:</b> No Change.
130.5(c)	<b>Voltage Drop:</b> No Change.
130.5(d)	<b>Circuit Controls for 120-Volt Receptacles and Controlled Receptacles:</b> No Change.
130.5(e)	<b>Demand Responsive Controls and Equipment:</b> Moved to Section 110.12.

T24 Section & Notes	 <b>Prescriptive – Change Summaries</b>
<b>Title 24, Part 6, Section 140.0 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES</b>	
	No Change.
<b>Title 24, Part 6, Section 140.2 – PRESCRIPTIVE APPROACH</b>	
	Minor Changes.
<b>Title 24, Part 6, Section 140.6 – INDOOR LIGHTING</b>	
140.6(a) Revised Table 140.6-A	<p><b>Calculation of Adjusted Indoor Lighting Power:</b> The EXCEPTION for 0.3W/ft<sup>2</sup> for large offices has been moved to a footnote allowance in Table 140.6-C.</p> <ol style="list-style-type: none"> <li>1. <b>Two Interlocked Lighting Systems:</b> No Change.</li> <li>2. <b>Reduction of Wattage Through Controls:</b> A few new PAFs added for daylighting design features associated with Section 140.3(d).</li> <li>3. <b>Lighting Wattage Excluded:</b> Minor Changes.</li> <li>4. <b>Luminaire Classification and Power Adjustment:</b> Some new provisions for adjusting input power of small aperture tunable-white and dim-to-warm LED luminaires, including control requirements to make the power adjustment. There is also clarification on how the Tailored Method display mounting height adjustments apply.</li> </ol>
140.6(b)	<p><b>Calculation of Allowed Indoor Lighting Power – General Rules:</b> No Change.</p>
140.6(c) Tables revised with reduced wattage allowances and building/space type designations.	<p><b>Calculation of Allowed Indoor Lighting Power – Specific Methodologies:</b> Clean-up to language regarding methodology of lighting methods and Complete Building, Area Category and Tailored Lighting (including mounting height adjustment factors) Methods lighting power density (LPD) allowances have been reduced to conform with LED technology (previous code cycles based on fluorescent technology) with all space types revised to align with ASHRAE 90.1.</p> <p>Table 140.6-B: Revised with reduced wattage allowances and new space-type names.                      Table 140.6-C: Revised with reduced wattage allowances and new space-type names.                      Tables 140.6-D-G: Revised with reduced wattage allowances and new space-type names.</p>
140.6(d)	<p><b>Automatic Daylighting Controls in Secondary Daylit Zones:</b> Clean up of EXCEPTION 1 clearly indicating that if there are less than 120 watts of general lighting in the combined secondary daylit zones, luminaires in Secondary Sidelit Daylit Zone(s) are exempt. AND new language added allowing for exception to spaces in which the COMBINED general lighting power in primary and secondary, luminaires in Secondary Sidelit Daylit Zone(s) are less than 240 watts.</p> <p>New EXCEPTION 3 in which the ratio of the projection of an overhang (no additional vertical window above the overhang) to the rise is &gt; 1.5 for south, east and west orientations, and &gt; 1 for north orientations.                      New EXCEPTION 5 for retail merchandise sales and wholesale showroom areas sidelit daylit zones.</p>
<b>Title 24, Part 6, Section 140.7 – OUTDOOR LIGHTING</b>	
	<p>Revised wattage allowances in Tables 140.7-A and 140.7-B with clearer guidance on which wattage allowance applies to asphalt versus concrete parking lots.</p> <p><b>Table 140.7-A</b> <b>Table 140.7-B</b></p>
<b>Title 24, Part 6, Section 140.8 – SIGNS</b>	
	Minor Changes.







Title 24, Part 6, Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS

141.0(b)	<p><b>Alterations</b></p> <p>1. <b>Mandatory Requirements:</b> Minor Changes.</p>
<p>This section has been rewritten.</p> <p><b>New</b> Table 141.0-F Control Requirements for Indoor Lighting Systems – Alterations</p>	<p>2. <b>Prescriptive Approach</b></p> <p>I. Altered Indoor Lighting Systems: Alterations now include <i>all</i> lighting changes (specific terms such as “luminaire component modification” have been eliminated) and Energy Code requirements are triggered when:</p> <ul style="list-style-type: none"> <li>• 10% or more of the number of luminaires in the space are altered (including ballast/driver AND lamp changes done at the same time).</li> <li>• Altering luminaires in a room that has more than one luminaire.</li> <li>• 51 luminaire replacements (one for one, i.e., retrofits) or more, in a year per floor (of a multi-floor building) or per tenant of a multi-tenant building.</li> <li>• Alteration will not disturb asbestos (unless asbestos is being removed at the same time the lighting alteration is happening).</li> </ul> <p>Alterations must meet the requirements of i, ii or iii below:</p> <p>i. <b>Lighting alterations</b> must meet lighting power requirements of Section 140.6 and lighting control requirements of Table 141.0-F.</p> <p>ii. If the alteration <b>does not exceed 80%</b> of the area category allowance in Section 140.6, see Table 141.0-F for control requirements.</p> <p>iii. If a <b>luminaire replacement project</b> (one for one, i.e., retrofits) limited to a building or tenant space of ≤5,000 ft<sup>2</sup> reduces existing wattage by 40% with the altered luminaires, see Table 141.0-F for control requirements.</p>
	<p>EXCEPTION for acceptance testing remains the same (controls being added to 20 or less luminaires).</p> <p>L. <b>Outdoor Lighting:</b> No Change.</p> <p>M. <b>Signs:</b> No Change.</p> <p>P. <b>Electrical Power Distribution Systems:</b> No Change.</p>

# MULTIFAMILY SPECIFIC

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Building Application	 <b>Mandatory</b>		 <b>Prescriptive</b>	 <b>Performance</b>	 <b>Additions Alterations</b>
	All Occupancy Subchapters 1-2, 4 (§§100.0-110.11)	Nonresidential Occupancy Subchapter 3 (§§120.0-120.9)	Subchapter 5 (§§140.0-140.9)	Subchapter 5 (§§140.0-140.1)	Subchapter 6 (§§141.0-141.1)
General (Solar Ready)	§110.10	§120.0	§§140, 140.2		
HVAC (conditioned)	§§110.2, 110.5	§§120.1, 120.2, 120.3, 120.4, 120.5, 120.8	§140.4	§§140.0, 140.1	§§141.0
Water Heating	§110.3	§§120.3, 120.8, 120.9	§140.5		

**T24 Section & Notes**  **Mandatory – Change Summaries**

**Title 24, Part 6, Section 110.10 – SOLAR READY BUILDINGS**

110.10(a)	<b>High-Rise Multifamily, including Mixed-Use Occupancy Buildings:</b> No Change.
110.10(b)	<p><b>Solar Zone:</b> Solar zones areas cannot be less than:</p> <p>1. <b>Minimum Solar Zone Area</b>  <b>Roof Area ≤ 10,000 ft²:</b> No Change.  <b>Roof Area &gt; 10,000 ft²:</b> No Change.</p> <p>B. <b>High-Rise Multifamily:</b>  EXCEPTION 1: PV system being installed with DC power rating of 1W/ft² of roof area.  EXCEPTION 2: Solar thermal system meeting Section 150.1(c)8Biii.  EXCEPTION 3: Potential solar zone area can be 50% less using areas NOT shaded by obstructions associated with the home: <ul style="list-style-type: none"> <li>• Low-sloped Roof: Roof area where annual solar access is ≥70%</li> <li>• Steep-sloped Roof: Roof area oriented 90°- 300° of true north in which the annual solar access is ≥70%</li> </ul> EXCEPTION 4 (Multifamily only): No solar ready requirements will apply if all dwelling unit thermostats meet the demand response control requirements of Section 110.12(a) and are capable of receiving/responding prior to final occupancy permit, and meet EITHER Title 24, Part 11, Appendix A4.106.8.2 for EV charging spaces OR one of the following: <ul style="list-style-type: none"> <li>i. ENERGY STAR® dishwasher and refrigerator OR <ul style="list-style-type: none"> <li>• A whole house fan (using electronically commutated motor) OR</li> </ul> </li> <li>ii. Demand response home automation system (per Section 110.12(a)) controlling appliances and lighting OR</li> <li>iii. CA Plumbing Code greywater system to be used for irrigation system OR</li> <li>iv. CA Plumbing Code rainwater catchment system using 65% of roof rainwater.</li> </ul> EXCEPTION 5: Roof used for parking, automobile hardscape or heliport. (No Change.)</p> <p>2. <b>Azimuth:</b> All sections of the solar zone located on steep-sloped roofs must oriented 90°- 300° of true north.</p> <p>3. <b>Shading:</b> No Change.</p> <p>4. <b>Structural Design Loads on Construction Documents:</b> No Change.</p>
110.10(c)	<p><b>Interconnection Pathways</b></p> <p>1. Drawings to indicate “reserved” location for future inverters/metering equipment/pathway for conduit between solar zone and electrical service AND</p> <p>2. Central water-heating systems to have drawings indicate “reserved” pathway for plumbing between solar zone and water heater</p>
110.10(d)	<b>Documentation:</b> No Change.
110.10(e)	<b>Main Electrical Service Panel:</b> Min. busbar rating of 200 amps and “reserved” space for future double pole circuit breaker labeled “For Future Solar Electric.”

Title 24, Part 6, Section 120.1 – VENTILATION AND INDOOR AIR QUALITY

120.1(b)1

**High-Rise Residential Buildings (see the Energy Code Ace fact sheet on What's Changed in 2019 for Low-Rise Residential for information on requirements for low-rise multifamily):** When the dwelling units are attached to each other, the following requirements must be met:

Aligning with ASHRAE 62.2

1. **Air Filtration:**

- A. **Mechanical Systems:** Systems that use forced air ducts to supply air to an occupiable space through ductwork exceeding 10 ft (3 m) in length, supply-only ventilation systems and supply side of mechanical balanced ventilation systems, including heat/energy recovery ventilation systems that provide outside air to an occupiable space, must be provided with required air filters.
- B. **System Design and Installation:** Systems must be designed to accommodate the pressure drop associated with all recirculated air or outdoor air supplied to the occupiable space is filtered before passing through any system thermal conditioning components. Heat/energy recovery ventilator filters can be downstream of thermal conditioning component provided the system is equipped with ancillary filtration upstream. Air filters must be min. 2" min. or a min. 1" if the filter(s) are sized according to Equation 120.1-A, based on a maximum face velocity of 150 ft/minute. Filters must be accessible for regular service by the system owner and permanently labeled for min. requirements for replacement filter.
- C. **Air Filter Efficiency:** MERV 13, or use a particle size efficiency rating specified in the Energy Code.
- D. **Air Filter Pressure Drop:** All systems must be provided with air filter(s) that conform to the applicable maximum allowable clean-filter pressure drop for 2" min. OR a max. of 25 PA (0.1" water) for a 1" min. OR for supply-only or balanced system the maximum allowable clean filter pressure drop determined by the system design.
- E. **Air Filter Product Labeling:** Products must be labeled by the manufacturer to disclose the efficiency and pressure drop ratings that demonstrate conformance to these requirements.

EXCEPTION to Section 120.1(b)1: Evaporative coolers are not subject to the air filtration requirements of Section 120.1(b)1.


2. **Attached Dwelling Units:** Must meet the requirements of ASHRAE Standard 62.2, with the following changes:

- A. Amendments to ASHRAE 62.2 requirements.
  - i. **Window operation** is no longer a method allowed to meet these ventilation requirements.
  - ii. **Continuous operation** of central forced air system air handlers used in central fan integrated ventilation systems is not a permissible method of providing the dwelling unit ventilation airflow.
  - iii. **Air filtration** 6.7 (Min. Filtration) and 6.7.1 (Filter Pressure Drop) shall not be required.
  - iv. **Mechanical ventilation airflow** must be provided at rates determined in accordance with Equation 120.1-B AND must have a balanced ventilation system OR if using a continuously operating system (supply or exhaust ventilation systems) THEN envelope leakage must be verified per Title 24, Part 6, Reference Nonresidential Appendix NA7.18.2 as being  $\leq 0.3 \text{ ft}^3/\text{minute}$  at 50 PA (0.2" of water)
  - v. **Central ventilation systems** that serve multiple dwelling-units must be balanced to provide ventilation airflow to each dwelling unit per Equation 120.1-B, limited to 20% above the specified rate using, for example, constant air regulation devices, orifice plates and variable speed central fans.
  - vi. **Kitchen range hoods** must be rated for sound per ASHRAE 62.2 Section 7.2.
  - vii. **Space Conditioning System Ducts:** ASHRAE 62.2 Section 6.5.2 is not required.
  - viii. **Control and Operation:** Manual switches associated with dwelling-unit ventilation systems must have a label clearly displaying the following or equivalent text: "This switch controls the indoor air quality ventilation for the home. Leave it on unless the outdoor air quality is very poor."
- B. **High-Rise Residential Dwelling Unit Acceptance:** NRCA forms must be registered through HERS provider.
  - i. **Airflow Performance:** Ventilation airflow must be verified per Title 24, Part 6, Reference Nonresidential Appendix NA7.18.1.
  - ii. **Kitchen Range Hoods:** Must be verified per Title 24, Part 6, Reference Nonresidential Appendix NA7.18.1 to confirm the model is rated by HVI to comply with the following requirements:
    - a) The minimum ventilation airflow rate as specified in ASHRAE 62.2 Section 5.
    - b) The maximum sound rating of 3 sones at one or more airflow settings 100 CFM or greater.

**Kitchen Hood Requirements: 2016 ASHRAE 62.2, Tables 5.1 and 5.2**

Ventilation Control Type	Application	Airflow
Demand-Controlled Local Ventilation Exhaust Airflow Rates	Enclosed Kitchen: permanent openings to interior adjacent spaces do not exceed a total of 60 ft <sup>2</sup>	<ul style="list-style-type: none"> <li>• Vented range hood (including appliance-range hood combinations): 100 CFM (50 L/s)</li> <li>• Other kitchen exhaust fans, including downdraft: 300 CFM (150 L/s) or a capacity of 5 ach</li> </ul>
	Non-enclosed Kitchen	<ul style="list-style-type: none"> <li>• Vented range hood (including appliance-range hood combinations): 100 CFM (50 L/s)</li> <li>• Other kitchen exhaust fans, including downdraft: 300 CFM (150 L/s)</li> </ul>
Continuous Local Ventilation Exhaust Airflow Rates	Enclosed Kitchen	5 air changes per hour, based on kitchen volume

Title 24, Part 6, Section 140.5 – SERVICE WATER HEATING SYSTEMS


140.5(b)	<b>High-Rise Residential and Hotel/Motel Occupancies:</b> See Section 150.1(c)8
<b>T24 Section &amp; Notes</b>	 <b>Prescriptive – Change Summaries</b>
150.1(c)8	<p><b>A. For systems serving individual units, use ONE of the following (i, ii, iii, iv OR v):</b></p> <ul style="list-style-type: none"> <li>i. One or more gas/propane instantaneous water heater input of 200,000 BTUH or less with NO storage tank</li> <li style="background-color: #d9ead3;">ii. One gas/propane 55 gal. or less storage water heater of 75,000 BTUH or less AND <ul style="list-style-type: none"> <li>fenestration weighted U-factor = 0.24 or less AND</li> <li>• HERS-verified compact hot water distribution system OR</li> <li>• HERS-verified drain water heat recovery system</li> </ul> </li> <li style="background-color: #d9ead3;">iii. One gas/propane more than 55 gal. storage water heater of 75,000 BTUH or less</li> <li style="background-color: #d9ead3;">iv. One heat pump water heater located in garage or conditioned space AND <ul style="list-style-type: none"> <li>• HERS-verified compact hot water distribution system AND HERS-verified drain water heat recovery system OR</li> <li>• CZ 2-15: PV system sized 0.3 kWdc larger than required in Section 150.1(c)14 OR</li> <li>• CZ 1 and 16: PV system sized 1.1 kWdc larger than required in Section 150.1(c)14</li> </ul> </li> <li>v. One NEEA Tier 3 or higher heat pump water heater located in garage or conditioned space. CZ 1 and 16 will ALSO need: <ul style="list-style-type: none"> <li>• PV system sized 0.3 kWdc larger than required in Section 150.1(c)14 OR</li> <li>• HERS-verified compact hot water distribution system</li> </ul> </li> </ul> <p><b>B. For systems serving multiple dwelling units:</b></p> <ul style="list-style-type: none"> <li>i. Minor Changes.</li> <li>ii. Minor Changes.</li> <li style="background-color: #d9ead3;">iii. Solar thermal water heating system per RA4 with min. solar fraction: <ul style="list-style-type: none"> <li>a. CZ 1-9 = 0.20 solar fraction; CZ10-16 = 0.35 solar fraction OR</li> <li>b. HERS-verified drain water heat recovery system can reduce solar fraction in CZ 1-9 = 0.15; CZ 10-16 = 0.30</li> </ul> </li> </ul>

# EXCEPTIONS FOR HEALTHCARE FACILITIES

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T24 Section & Notes		 <b>Mandatory – Change Summaries</b>	
<b>Title 24, Part 1, Section 10-103 – PERMIT, CERTIFICATE, INFORMATIONAL, AND ENFORCEMENT REQUIREMENTS FOR DESIGNERS, INSTALLERS, BUILDERS, MANUFACTURERS, AND SUPPLIERS</b>			
10-103(a)	<b>Documentation:</b> Healthcare Facilities must meet documentation requirements of Title 24, Part 1, Chapter 7 – Safety Standards for Health Facilities.		
<b>Title 24, Part 6, Section 100.0 – SCOPE</b>			
100.0(a) New Occupancy!	Occupancy I (Institutional) does NOT include I-3 (prisons) and I-4 (day care facilities), but does include: <ul style="list-style-type: none"> <li>I-1 (assisted living facilities)</li> <li>I-2 (hospitals and nursing homes)</li> </ul>		
100.0(h)	<b>HEALTHCARE FACILITY</b> is any building or portion thereof licensed pursuant to California Health and Safety Code Division 2, Chapter 1, Section 1204 or Chapter 2, Section 1250.		
<b>Mechanical</b>			
T24 Section & Notes		 <b>Mandatory – Change Summaries</b>	
<b>Title 24, Part 6, Section 110.3 – SERVICE WATER-HEATING SYSTEMS AND EQUIPMENT</b>			
110.3(a)	<b>Certification by Manufacturers:</b> Temperature controls: Healthcare Facilities have option to use CA Plumbing Code Table 613.1.		
110.3(c)1	<b>Outlet Temperature Controls:</b> Systems covered by CA Plumbing Code Section 613.0 for outlet temperature controls must meet those requirements instead of Title 24, Part 6 requirements.		
<b>Title 24, Part 6, Section 120.1 – VENTILATION AND INDOOR AIR QUALITY</b>			
120.1(a)	<b>General Requirements</b> <ol style="list-style-type: none"> <li>Healthcare Facilities must be ventilated in accordance with Chapter 4 of the California Mechanical Code and are NOT required to meet the ventilations requirements of Title 24, Part 6.</li> </ol>		
<b>Title 24, Part 6, Section 120.2 – CONTROLS FOR SPACE-CONDITIONING SYSTEMS</b>			
120.2(b)	<b>Criteria for Zonal Thermostatic Controls:</b> Thermostatic deadband, setback capabilities and automatic demand shed controls requirements are exempt for Healthcare Facilities. Otherwise no major changes.		
120.2(e)	<b>Occupancy Sensing Zone Controls:</b> Healthcare Facilities ARE exempt.		
<b>Title 24, Part 6, Section 120.4 – AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS</b>			
	Healthcare Facilities must comply with CA Mechanical Code.		
<b>Title 24, Part 6, Section 120.5 – MECHANICAL SYSTEM ACCEPTANCE</b>			
	Healthcare Facilities ARE exempt.		
T24 Section & Notes		 <b>Prescriptive – Change Summaries</b>	
140.4(b)	<b>Calculations:</b> Healthcare Facilities must comply with CA Mechanical Code as regulated by OSHPD, including references for indoor/outdoor conditions.		
140.4(c)	<b>Fan Systems:</b> Each fan system used for space conditioning and having a total fan system motor nameplate horsepower exceeding 5 hp must meet the requirements of Items 1, 2 and 3. <ol style="list-style-type: none"> <li><b>Fractional HVAC Motors for Fans:</b> There are two new EXCEPTIONS including process load fan system power and systems serving Healthcare Facilities.</li> </ol>		
140.4(d)	<b>Space-conditioning Zone Controls:</b> New EXCEPTION for systems serving Healthcare Facilities.		
140.4(f)	<b>Supply Air Temperature Reset Controls:</b> New EXCEPTION for Healthcare Facilities.		
140.4(j)	<b>Limitation of Air-Cooled Chillers:</b> New EXCEPTION for Healthcare Facilities.		
140.4(k)	<b>Hydronic System Measures:</b> New EXCEPTION for Healthcare Facilities.		
140.4(l)	<b>Air Distribution System Duct Leakage Sealing:</b> New EXCEPTION for Healthcare Facilities which will must comply with the CA Mechanical Code.		
140.4(m)	<b>Fan Control:</b> New EXCEPTION for Healthcare Facilities.		
140.4(n)	<b>Mechanical System Shut-off:</b> New EXCEPTION for Healthcare Facilities.		
140.4(o)	<b>Exhaust System Transfer Air:</b> New EXCEPTION for Healthcare Facilities.		

<b>Covered Process</b>	
<b>T24 Section &amp; Notes</b>	 <b>Mandatory – Change Summaries</b>
120.6(e)	<b>Compressed Air Systems:</b> Healthcare Facilities are exempt from these requirements.
120.6(f)	<b>Elevators:</b> Healthcare Facilities are exempt from these requirements.
<b>T24 Section &amp; Notes</b>	 <b>Prescriptive – Change Summaries</b>
<b>Title 24, Part 6, Section 140.9 – COVERED PROCESSES</b>	
140.9(a)	<b>Computer Rooms:</b> New EXCEPTION for Healthcare Facilities.
140.9(b)	<b>Commercial Kitchens:</b> New EXCEPTION for Healthcare Facilities.
140.9(c)	<b>Laboratory and Factory Exhaust Systems:</b> New EXCEPTION for Healthcare Facilities.
<b>Envelope</b>	
<b>T24 Section &amp; Notes</b>	 <b>Mandatory – Change Summaries</b>
<b>Title 24, Part 6, Section 110.10 – SOLAR READY BUILDINGS</b>	
110.10(a)4	Healthcare Facilities are exempt from these requirements.
<b>Commissioning</b>	
<b>T24 Section &amp; Notes</b>	 <b>Mandatory – Change Summaries</b>
<b>Title 24, Part 6, Section 120.8 – BUILDING COMMISSIONING</b>	
	Healthcare Facilities must comply with Chapter 7 of the CA Administrative Code (Title 24, Part 1) instead of Title 24, Part 6.
<b>Lighting</b>	
<b>T24 Section &amp; Notes</b>	 <b>Mandatory – Change Summaries</b>
<b>Title 24, Part 6, Section 130.1 – INDOOR LIGHTING CONTROLS</b>	
130.1(a)	<b>Manual Area Controls</b> 2. <b>Located in the Enclosed Areas:</b> New exception for Healthcare Facilities in rooms in which the control in the room would pose health and safety hazard (such as psychiatric and secure areas, and single occupant restroom/bathing rooms).
130.1(b)	<b>Multi-Level Lighting Controls:</b> Healthcare Facilities are exempt from these requirements.
130.1(c)	<b>Shut-OFF Controls:</b> Healthcare Facilities exempt from these requirements.
<b>Title 24, Part 6, Section 130.3 – SIGN LIGHTING CONTROLS</b>	
	Healthcare Facilities are exempt from these requirements.
<b>Title 24, Part 6, Section 130.4 – LIGHTING CONTROL ACCEPTANCE/ INSTALLATION CERTIFICATE</b>	
	Healthcare Facilities must comply with OSHPD requirements, not Title 24, Part 6.

<b>Electrical Distribution</b>	
<b>T24 Section &amp; Notes</b>	 <b>Mandatory – Change Summaries</b>
<b>Title 24, Part 6, Section 130.5 – ELECTRICAL POWER DISTRIBUTION SYSTEMS</b>	
130.5(a)	<b>Service Electrical Metering:</b> New EXCEPTION for systems subject to CA Electrical Code Article 517 (Healthcare Facilities).
130.5(b)	<b>Separation of Electrical Circuits for Electrical Energy Monitoring:</b> New EXCEPTION for systems subject to CA Electrical Code Article 517 (Healthcare Facilities).
130.5(d)	<b>Circuit Controls for 120-Volt Receptacles and Controlled Receptacles:</b> New EXCEPTION for Healthcare Facilities.
<b>Additions &amp; Alterations</b>	
<b>Title 24, Part 6, Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS</b>	
	Healthcare Facilities are EXEMPT from the requirements for all additions and alterations.



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