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# 2019 Building Energy Efficiency Standards

## SUBCHAPTER 5

## Section 140.0

NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL OCCUPANCIES—PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY

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# §140.3(a)3– Envelope Component Requirements

- Clarified Exception 2 to §140.3(a)1Ai and Exception to §140.3(a)1Aiia is dependent on weight, not thermal mass
  - "Roof constructions with a weight of at least 25 lb/ft$^2$ over the roof membrane…"
- Updated Tables 140.3-C and 140.3-D to align with the new thermal mass definition
  - "Light mass walls are walls with a density less than or equal to 95 pounds per cubic foot. Heavy mass walls are walls with a density greater than 95 pounds per cubic foot"

# §140.3(a)5 - Fenestration

- **§140.3(a)5C & §140.3(a)5D** – Inserted a new exception for demising walls to clarify that they are not considered exterior walls and therefore are not subject to the fenestration requirements of §140.3(a)5
  - Example:
    - "EXCEPTION 3 to §140.3(a)5c: Demising walls are not exterior walls, and therefore windows in demising walls are not subject to the SHGC requirements."

# §140.4(a) - Sizing and Equipment and §140.4(b) - Calculations (New)

Edits to the scope of this section to accommodate healthcare facilities including:

- Heating and cooling loads
- Indoor design conditions
- Outdoor design conditions

# §140.4(c) - Fan Systems (New)

Each fan systems with a total nameplate horsepower exceeding 5 hp:

Fan power limitations depending on constant or variable air volume;

Table 140.4-A – Fan Power Limitation Table

Table 140.4-B – Fan Power Limitation Pressure Drop Adjustment

# §140.4(d) - Space Conditioning Zone Controls

No new requirements

Section was re-worked to bring the previous EXCEPTION 1 to 140.4(d) into the Standards

Odd to have such an extensive EXCEPTION, made more sense to include it as an option for acceptable zone controls

# §140.4(e) - Economizers (New)

Expanded the water economizer requirements to not just forced air systems.

New water economizer requirements:

- Maximum pressure drop
  - Less than 15 feet of water; or
  - Secondary loop to bypass the heat exchanger
- Full integration to provide partial cooling

# §140.4(h)5 - Cooling Tower Efficiency (New)

Open-circuit cooling towers serving condenser water loops of 900 gpm or greater:

- Minimum efficiency of 80 gpm/hp
- EXCEPTION of replacement of building mounted towers
- EXCEPTION of towers serving buildings in Climate Zone 1 and 16.

# §140.4(l) - Duct Leakage (New)

- Added a requirement for duct systems serving healthcare facilities
- Directs users to the OSHPD amendments to the California Mechanical Code
- This change is consistent with current practice

# §140.4(o) - Exhaust System Transfer Air (NEW)

- Sets limitations on conditioned air delivered to any space with mechanical exhaust
- Conditioned air shall not exceed the greater of:
  - Supply flow required for heating or cooling; or
  - Ventilation rate required; or
  - Mechanical exhaust flow minus the available transfer air

❖ Available transfer air is defined as the 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)

# §140.5(b)–Prescriptive Requirement for Service-Water Heating Systems

Add exception for High-Rise Residential and Hotel/Motel Occupancies

- Buildings of five stories and higher are not required to comply with the solar fraction requirement

# §140.6 Indoor Lighting Power Allowance

- Lowered the lighting power density values for all three calculation methods to account for LED lighting
- Updated the specific terms used for types of buildings and areas under all three approaches
- Updated the formats of the tables
- For an area not defined in Table 140.6-C, allowed a reasonably equivalent type to be chosen for the area and LPD value (§ 140.6(c)2.A)

# Table 140.6-B for Complete Building Method

- New values (example)

| Type of Building | Allowed Lighting Power Density |
|---|---|
| Assembly Buildings | 0.70 W/ft$^2$ |
| Commercial and Industrial Storage Building | 0.45 W/ft$^2$ |
| Financial Institution Building | 0.65 W/ft$^2$ |
| Industrial/Manufacturing Facility Building | 0.60 W/ft$^2$ |
| Office Building | 0.65 W/ft$^2$ |
| Parking Garage Building | 0.13 W/ft$^2$ |
| School Building | 0.65 W/ft$^2$ |
| All others buildings | 0.40 W/ft$^2$ |

# Table 140.6-C for Area Category Method

- New format and values (example)

| Primary Function Area | Allowed LPD | Additional Lighting Power allowed | |
|---|---|---|---|
| | | Qualitied Lighting Systems | Additional LPD |
| Auditorium | 0.70 W/ft$^2$ | Ornamental | 0.30 W/ft$^2$ |
| | | Accent, display and feature | 0.20 W/ft$^2$ |
| Office Area (>250 SF) | 0.65 W/ft$^2$ | Portable lighting | 0.20 W/ft$^2$ |
| Office Area (≤250 SF) | 0.70 W/ft$^2$ | | |

# Table 140.6-D for Tailored Method

- New values (example)

| Primary Function Area | General Illumination Level | Wall Display Lighting Power | Allowed Combined Floor Display and Task Lighting | Additional Ornamental Special Effect Lighting |
|---|---|---|---|---|
| Auditorium Area | 300 Lux | 3.00 W/ft | 20 W/ft$^2$ | 40 W/ft$^2$ |

- Table 140.6-E: Modified the adjustment factors for Wall Display Lighting and Floor Display Lighting
- Table 140.6-G: Modified the Tailored Method general lighting power allowed by Room Cavity Ratio

# § 140.6 Calculation of Actual Lighting Power

- The lighting power for Portable lighting for office is now in Table 140.6-C, rather than stated as an Exception.
- §140.6(a)4B: Added for tunable-white and dim-to-warm LED luminaires
  - Qualifying luminaires include small aperture LED luminaires with color changing qualities
- §140.6(a)4C: Added for wall display and floor display luminaires
  - Qualifying luminaires as specified in Tailored Method

# § 140.6 Daylighting Devices for Power Adjustment Factors (PAF)

**Table 140.6-A for Lighting Power Adjustment Factors (PAF)**

(Part of the Table below)

- Clerestories PAF value: 0.05
- Horizontal Slat PAF value: 0.05
- Interior and Exterior Light Shelves PAF value: 0.10

# Table 140.7-A General Hardscape Lighting Power Allowance

- New values (example)

| | LZ2 Asphalt | LZ2 Concrete | LZ3 Asphalt | LZ3 Concrete |
|---|---|---|---|---|
| Area Wattage Allowance | 0.023 W/ft$^2$ | 0.025 W/ft$^2$ | 0.025 W/ft$^2$ | 0.03 W/ft$^2$ |
| Linear Wattage Allowance | 0.17 W/lf | 0.4 W/lf | 0.25 W/lf | 0.4 W/lf |
| Initial Wattage Allowance | 250 watts | 250 watts | 350 watts | 350 watts |

- A new lighting power allowance for narrow band spectrum lighting where required by local or state law

# Table 140.7-B Special Application Lighting Power Allowance

| Lighting Application | Lighting Zone 0 | Lighting Zone 1 | Lighting Zone 2 | Lighting Zone 3 | Lighting Zone 4 |
|---|---|---|---|---|---|
| WATTAGE ALLOWANCE PER APPLICATION. Use all that apply as appropriate. | | | | | |
| **Building Entrances or Exits.** Allowance per door. Luminaires qualifying for this allowance shall be within 20 feet of the door. | Not Applicable | ~~15~~ 9 watts | ~~25~~ 15 watts | ~~35~~ 19 watts | ~~45~~ 21 watts |
| **Primary Entrances to Senior Care Facilities, Police Stations, Hospitals, Fire Stations, and Emergency Vehicle Facilities.** Allowance per primary entrance(s) only. Primary entrances shall provide access for the general public and shall not be used exclusively for staff or service personnel. This allowance shall be in addition to the building entrance or exit allowance above. Luminaires qualifying for this allowance shall be within 100 feet of the primary entrance. | Not Applicable | ~~45~~ 20 watts | ~~80~~ 40 watts | ~~120~~ 57 watts | ~~130~~ 60 watts |
| **Drive Up Windows.** Allowance per customer service location. Luminaires qualifying for this allowance shall be within 2 mounting heights of the sill of the window. | Not Applicable | ~~40~~ 16 watts | ~~75~~ 30 watts | ~~125~~ 50 watts | ~~200~~ 75 watts |
| **Vehicle Service Station Uncovered Fuel Dispenser.** Allowance per fueling dispenser. Luminaires qualifying for this allowance shall be within 2 mounting heights of the dispenser. | Not Applicable | ~~120~~ 55 watts | ~~175~~ 77 watts | ~~185~~ 81 watts | ~~330~~ 135 watts |
| **ATM Machine Lighting.** Allowance per ATM machine. Luminaires qualifying for this allowance shall be within 50 feet of the dispenser. | Not Applicable | ~~250~~ 100 watts for first ATM machine, ~~70~~ 35 watts for each additional ATM machine | | | |

# §140.9(a) Computer Rooms and (b) Commercial Kitchens (New)

- Aligned with the Fault Detection and Diagnostics requirement of §120.2(i) for computer rooms with an air economizers

- Added an EXCEPTION to both §140.9(a) and §140.9(b) for healthcare facilities

# §140.9(c) Laboratory and Process Exhaust Systems (NEW)

- §140.9(c)2 Aligned with the Exhaust System Transfer Air Section of 140.4(o)
- §140.9(c)3Fan System Power Consumption for systems greater than 10,000 CFM
  - Meet the discharge requirements in ANSI Z9.5-2012; and
  - Fan system power demand less than or equal to 0.65 w/cfm; or
  - Variable air flow rate based on wind speed and wind direction; or
  - Variable air flow rate based on measured contaminant concentration
- § 140.9(c)3 include an Acceptance Test procedure to verify proper function of the exhaust system

# §140.9(c) Laboratory and Process Exhaust Systems (New)

- §40.9(c)4 Fume Hood Automatic Sash Closure based on laboratories that are fume hood intensive
- Table 140.9-B lists the thresholds for fume hood intensive laboratories
- The automatic closure system must be capable of:
  - Detecting people with a dedicated zone presence sensor
  - Controls to prevent closing against a force no more than 10 lbs
  - Detecting obstructions that would prevent the sash from closing, including transparent materials
- Acceptance Test to verify proper sash function

# KEY WEB-LINK

**2019 Title 24 Utility-Sponsored Stakeholder**
http://title24stakeholders.com/

**Building Energy Efficiency Program**
http://www.energy.ca.gov/title24/

**Comments to be submitted to**
https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=17-BSTD-01

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