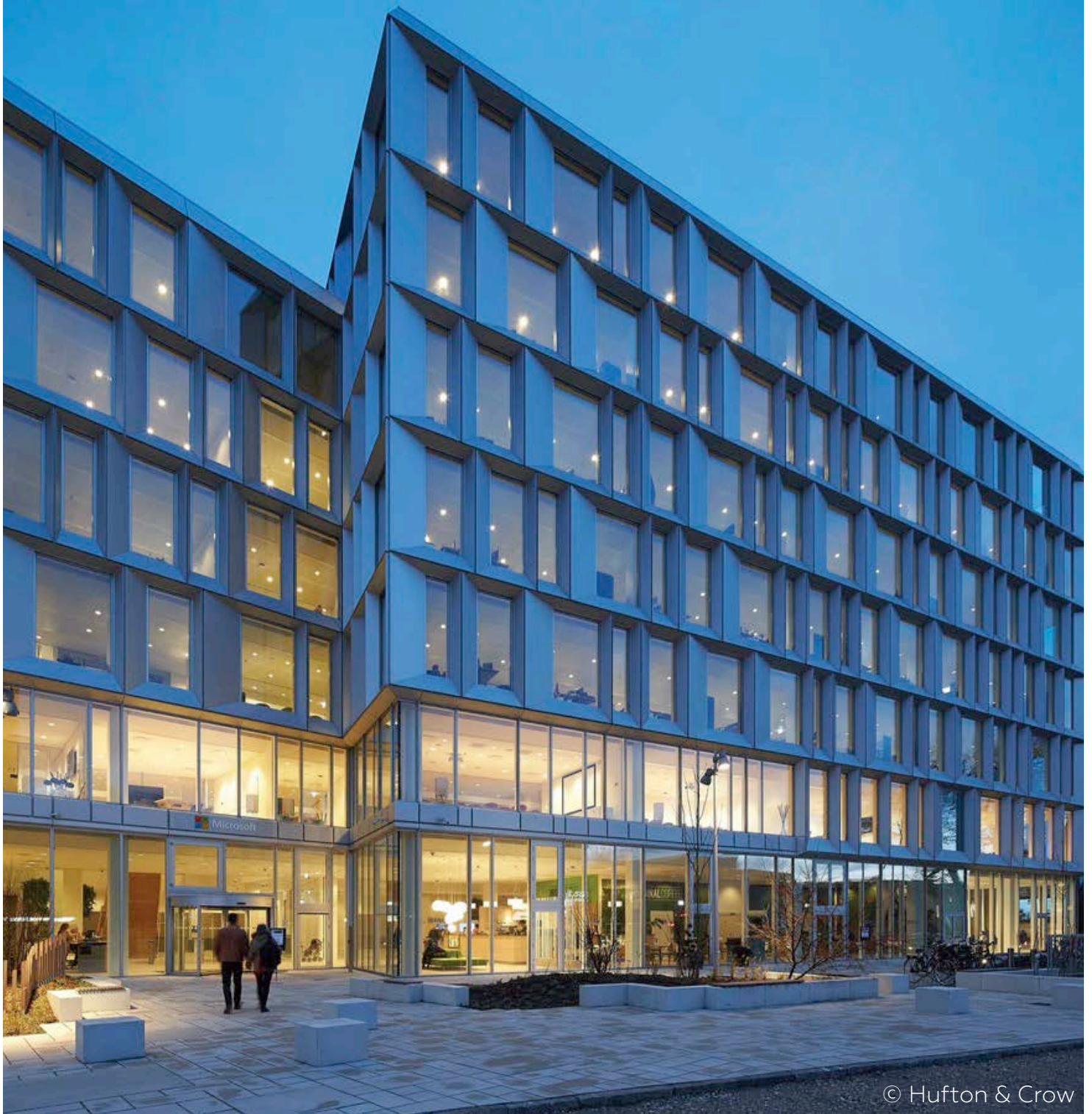




TITLE 24 LIGHTING THE BASICS

2018 NON-RESIDENTIAL LIGHTING REGULATIONS





What is Title 24?

Title 24, also known as the California Building Standards Code, sets energy standards for all new residential and commercial buildings and regulates alterations to existing buildings.

Why is it important?

Title 24 is paving the way for energy conservation in the state of California. This means reduced energy costs, not to mention a greener future for all.

As technologies like LED make headway in residential and commercial lighting, Title 24 requirements become more stringent to reflect the increased energy efficiency of available products.

At Alcon, many of our products are geared toward Title 24 compliancy. We can help you pass acceptance tests without knowing Title 24 line by line.

Key changes that take effect as of January 1, 2017

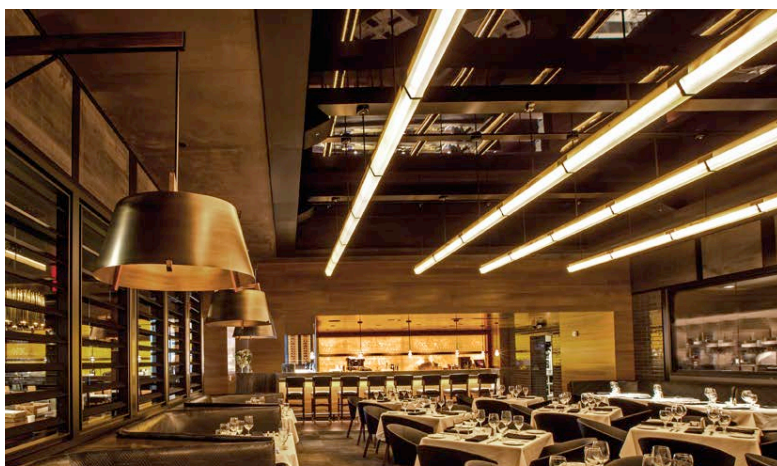
Timeout for occupancy and vacancy sensors changed from 30 minutes to 20 minutes. Classrooms, conference rooms, offices <250 square feet and multipurpose rooms <1,000 square feet are now required to have either a Vacancy Sensor (automatic OFF, manual ON) or a Partial-ON Occupancy Sensor (automatic OFF, automatic ON to 50-70% of full power).

- Lower Lighting Power Density allowances for many area types.
- Two new Power Adjustment Factors for institutional tuning and daylight harvesting.
- Three PAF eliminated.
- Requirements for alterations are now less stringent.

Keywords

LPD - Lighting Power Density. The lighting allowance allotted by Title 24 expressed as watts per square foot.

Why it's important: The 2016 edition of Title 24 reduced the LPD for many types of spaces and buildings, making the requirements even tougher than the 2013 edition. Fortunately, LEDs are still the solution for meeting Title 24 standards.



Acceptance Test - An engineering term for "testing to see if the requirements of the code are met".

Why it's important: Acceptance testing is a requirement of Title 24.

Vacancy Sensor: Lights automatically turn OFF when the room is vacant for ≤ 20 minutes, but only turn on manually.

Why it's important: A vacancy sensor is the most energy friendly of all sensor options, because lights will automatically shut-off if the room is unoccupied and will only turn back on again manually.

Occupancy Sensor, Partial-ON: Lights automatically turn OFF when the room is vacant for ≤ 20 minutes. Lights automatically turn ON to 50-70% when someone enters the room.

Why it's important: Partial-ON is the second most energy friendly of all the sensor options. Lights will switch ON automatically but not to 100%, with the expectation that most people won't bother to turn on more lights or adjust the lighting level.

Occupancy Sensor, Partial-OFF: Lights automatically dim to 50% or less of full power when the space is vacant for ≤ 20 minutes. Lights automatically turn ON when someone enters.

Why it's important: Partial-OFF occupancy sensors are required for corridors, stairwells, and other spaces where full OFF is not feasible.

Multi-Level Lighting Controls: Lighting controls that reduce the power going to a lighting system in multiple steps—usually means a dimmer.

Why it's important: Multi-level Lighting Controls are required for any enclosed area 100 square feet or larger, with a connected lighting load that exceeds 0.5 watts per square foot.

Daylighting Controls: Controls that use one or more photosensors to detect changes in daylight illumination, adjusting the lighting level in response.

Why it's important: Daylighting controls are required in daylit zones, as defined by Title 24. Primary daylit zones must be controlled separately from secondary daylit zones.

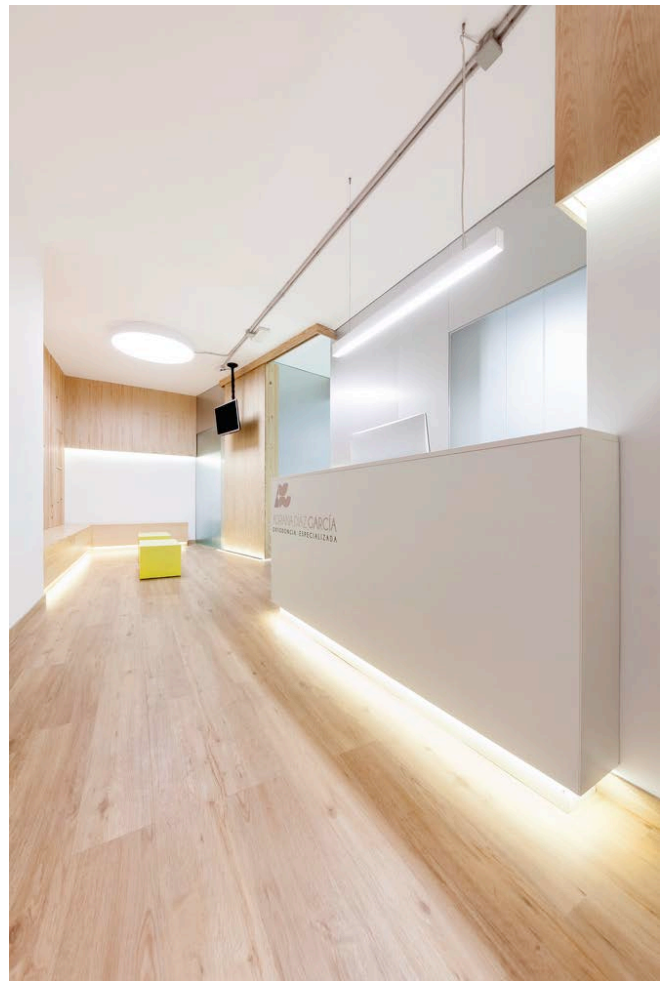
Local Switch: Manual switch that is easily accessible.

Why it's important: Most spaces require a local switch, although there are exceptions for public restrooms, stairwells, and corridors.

Automatic Time-Switch Control: Programmable time clock that turns off lighting when a space is typically unoccupied.

Why it's important: Meets the requirement for an occupancy/vacancy sensor for some types of spaces.

Area Category Method: Values for LPD in this document are those allotted by the Area Category Method, one of three possible methods for meeting Title 24 requirements



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CLASSROOM, LECTURE HALL, TRAINING ROOM

REQUIREMENTS:

Local Switch

Vacancy Sensor

or

Occupancy Sensor, Partial-ON

Multi-level Lighting Controls

Daylight Controls

LPD: 1.2 WATTS/FT²



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CONFERENCE ROOM, MEETING ROOM, MULTIPURPOSE ROOM

REQUIREMENTS:

Local Switch

Vacancy Sensor

or

Occupancy Sensor Partial-ON

Multi-level Lighting Controls

Daylight Controls

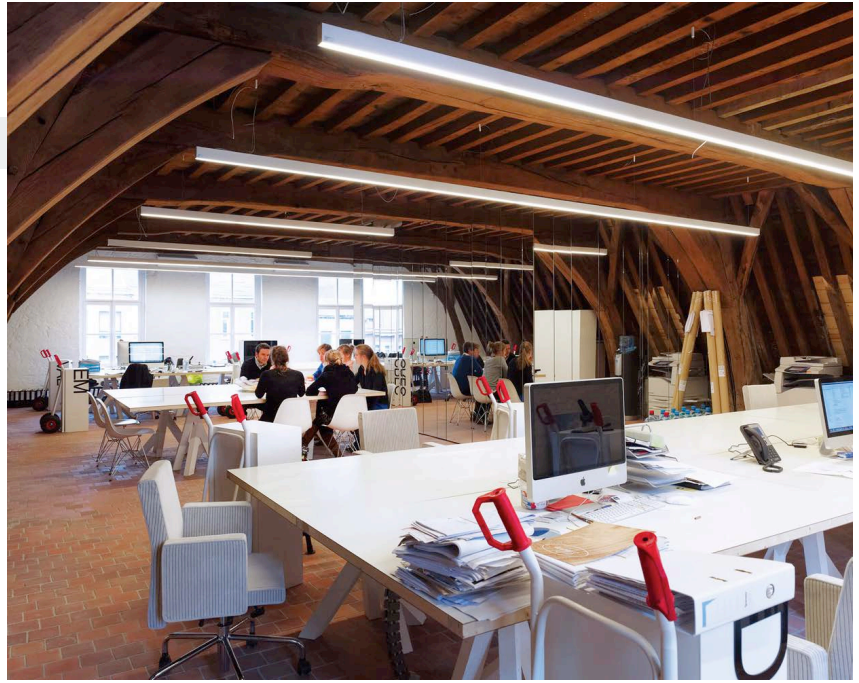
LPD: 1.2 WATTS/FT²

* Classrooms with a connected general lighting load of 0.7 watts per square foot or less shall have at least one control step between 30-70 percent of full rated power.

OFFICE > 250 SQ. FT

REQUIREMENTS:

- Local Switch
- Vacancy Sensor
- or
- Occupancy Sensor, Partial-ON
- Multi-level Lighting Controls
- Daylight Controls
- LPD: 1.0 WATTS/FT²



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OFFICE < 250 SQ. FT.

REQUIREMENTS:

- Local Switch
- Automatic Time-Switch Control
- or
- Vacancy Sensor
- or
- Occupancy Sensor Partial ON
- Multi-level Lighting Controls
- Daylight Controls
- LPD: 0.75 WATTS/FT²

RESTROOM

REQUIREMENTS:

- Local Switch*
- Automatic Time-Switch Control
- Vacancy Sensor
- or
- Occupancy Sensor Partial-ON
- Multi-level Lighting Controls*
- Daylight Controls
- LPD: 0.60 WATTS/FT²



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CORRIDOR

REQUIREMENTS:

- Programmable Timeclock
- or
- Occupancy Sensor, Partial-OFF
- Multi-level Lighting Controls
- Daylight Controls
- LPD: 0.60 WATTS/FT²

* Not required for public restrooms with 2 or more stalls.

* Public restrooms shall have at least one control step between 30-70 percent of full rated power.

STAIRWELL

REQUIREMENTS:

Programmable Timeclock
or
Occupancy Sensor Partial-OFF
Multi-level Lighting Controls
Daylight Controls
LPD: 0.6 WATTS/FT²



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STORAGE ROOM > 100 SQ FT

REQUIREMENTS:

Local Switch
Programmable Timeclock
or
Vacancy Sensor
or
Occupancy Sensor, Partial-ON
Multi-level Lighting Controls
Daylight Controls
LPD: 0.60 WATTS/FT²

TABLE 140.6-C AREA CATEGORY METHOD-LIGHTING POWER DENSITY VALUES (WATTS/FT²)

PRIMARY FUNCTION AREA		ALLOWED LIGHTING POWER DENSITY (W/ft ²)	PRIMARY FUNCTION AREA		ALLOWED LIGHTING POWER DENSITY (W/ft ²)
Auditorium Area		1.40 ³	Library Area	Reading areas	1.1 ³
Auto Repair Area		0.90 ²		Stack areas	1.5 ³
Beauty Salon Area		1.7	Lobby Area	Hotel lobby	0.95 ³
Civic Meeting Place Area		1.3 ³		Main entry lobby	0.95 ³
Classroom, Lecture, Training, Vocational Areas		1.2 ⁵	Locker/Dressing Room		0.70
Commercial and Industrial Storage Areas (conditioned and unconditioned)		0.60	Lounge Area		0.90 ³
Commercial and Industrial Storage Areas (refrigerated)		0.7	Malls and Atria		0.95 ³
Convention, Conference, Multipurpose and Meeting Center Areas		1.2 ³	Medical and Clinical Care Area		1.2
Corridor, Restroom, Stair, and Support Areas		0.60	Office Area	> 250 square feet	0.75
Dining Area		1.0 ³		≤ 250 square feet	1.0
Electrical, Mechanical, Telephone Rooms		0.55 ²	Parking Garage Area	Parking Area ¹⁰	0.14
Exercise Center, Gymnasium Areas		1.0		Dedicated Ramps	0.30
Exhibit, Museum Areas		1.8		Daylight Adaptation Zones ⁹	0.60
Financial Transaction Area		1.0 ³	Religious Worship Area		1.5 ³
General Commercial and Industrial Work Areas	Low bay	0.9 ²	Retail Merchandise Sales, Wholesale Showroom Areas		1.2 ^{6 and 7}
	High bay	1.0 ²			
	Precision	1.2 ⁴	Theater Area	Motion picture	0.90 ³
Grocery Sales Area	1.2 ^{6 and 7}	Performance		1.4 ³	



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Disclaimer: The information herein is not intended to replace the professional advice of your architect, contractor, electrician, or lighting designer. Though we aim to provide the most accurate and up-to-date information, we cannot not guarantee accuracy.