



Scope: Lighting system controls for interior and exterior applications
Exceptions: Where automatic shutoff could endanger safety or security: exit stairs, ramps, and passageways; emergency lighting normally off. Emergency lighting serving exit access without a building fire alarm. Up to 0.02W/ft² serving exit access with a building fire alarm
Alterations, Interior: Comply with all lighting control and test requirements when lighting or controls are altered, or when walls are added or moved.
Alterations, Exterior: Comply with all exterior control requirements when controls are altered or when luminaries totaling more than 400 watts are added or replaced. <ul style="list-style-type: none">▪ Exception: Individual luminaries < 50 watts and when tested to turn off during daylight hours.

OCCUPANCY SENSOR REQUIREMENTS

Occupancy Sensor Controls C405.2.1 <ul style="list-style-type: none">• Lights auto off within 20 minutes of occupants leaving• Manual off control	Required for the Following Space Types <ul style="list-style-type: none">• Class/lecture/training• Conference/meeting• Copy/print rooms• Lounges/break rooms• Computer rooms• Laundry/wash areas• Enclosed offices• Open plan offices• Restrooms• Storage rooms• Data Centers• Telemedicine rooms• Locker Rooms• Spaces ≤300ft²• Warehouses• Corridors• Medical supply rooms	Key Exceptions <ul style="list-style-type: none">• Specific Application Control luminaires of C405.2.5
Manual On or Partial Auto On C405.2.1.1.2 <ul style="list-style-type: none">• Manual on or partial auto on to ≤ 50% power	Lighting Full Auto On Only Permitted for <ul style="list-style-type: none">• Corridors• Stairways• Interior Parks• Where manual on would endanger safety or security• Lobbies• Locker Rooms• Library Stacks• Restrooms	Key Exceptions <ul style="list-style-type: none">• Where full auto on is permitted, Manual Controls, Manual On and Partial Auto On control is not required
Warehouse Aisle & Open Areas C405.2.1.2 <ul style="list-style-type: none">• Automatically reduce lighting ≥ 50% within 20 minutes of occupants leaving• Auto off by occupancy sensor or timeswitch• Manual control to turn lighting off	Each aisle independently controlled, cannot control lighting beyond aisles	Key Exceptions <ul style="list-style-type: none">• None
Occupancy Sensors in Open Office C405.2.1.3 <ul style="list-style-type: none">• Control zones limited to no more than 600ft²• Auto On permitted in occupied zone, unoccupied zones auto on to not more than 20% lighting power• Auto off or reduce general lighting in control zone to ≤ 20% lighting power within 20 minutes of occupants leaving control zone• Auto off all control zones within 20 minutes of all occupants leaving the open plan office	In Mall Concourses, Auditoriums, Sales Areas, Manufacturing Facilities, Sports Arenas <p>Override permitted > 2 hours with captive key switch Control area ≤ 20,000ft²</p>	Key Exceptions <ul style="list-style-type: none">• Specific Application Control luminaires of C405.2.5• Where patient care is directly provided
Occupancy Sensors in Corridors C405.2.1.4 <ul style="list-style-type: none">• Uniformly reduce lighting not more than 50% lighting power within 20 minutes of occupants leaving		Key Exceptions <ul style="list-style-type: none">• Corridors with less than two footcandles at darkest point with all lighting on

TIMESWITCH REQUIREMENTS (where occupancy sensors not used)

Timeswitch Controls C405.2.2 <ul style="list-style-type: none">• Auto off lighting when scheduled unoccupied• Provide manual override & light reduction control• Override for ≤ 2 hours, control area ≤ 5,000ft²• Where time schedules are not available, program lighting off ≥ 12 hours per day	Required for the Following Space Types <ul style="list-style-type: none">• Corridors (not manufacturing)• Lobbies• Library stacks• Offices (>300ft²) in ≤ 600ft² zones• Classroom labs• Stairwells• Warehouses• Storage rooms > 1,000ft²	Key Exceptions <ul style="list-style-type: none">• None
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ADDITIONAL INTERIOR LIGHTING CONTROL REQUIREMENTS

Dimming Controls C405.2.3 <ul style="list-style-type: none">• Manual controls continuously dim from full output to ≤ 10% lighting power, and turn lighting off	Required for the Following Space Types <ul style="list-style-type: none">• Class/lecture/training• Conference/meeting• Dining Area• Laboratory• Lobby• Any space without occupancy sensor shut off control• Lounge/break room• Multipurpose• Offices• Gym/fitness center• Library reading• Health care Facilities:<ul style="list-style-type: none">• Exam, imaging• Nursery• Nurses station	Key Exceptions <ul style="list-style-type: none">• Specific application controlled luminaires• Where high-end trim is provided and calibration is only accessible to authorized personnel
Manual Controls C405.2.6 <ul style="list-style-type: none">• Readily accessible to occupants• Controlled lighting is visible from manual control device	Choose between switching or dimming manual controls	Key Exceptions <ul style="list-style-type: none">• When installed remotely, identify the area controlled and indicate the lighting's status
Daylight Responsive Control C405.2.4 <ul style="list-style-type: none">• Sidelit: Primary & secondary daylight zones• Toplit: Single primary daylight zone• Automatic continuous dimming of general lighting to ≤ 15% full power• Configure to completely turn lighting off• Authorized calibration in space with ready access• Control sidelit independent of toplit zone	<div>Is primary daylight zone lighting power >75W? Is primary and secondary daylight zone lighting > 150W?</div> <div>YES</div> <div>NO</div> <div>Daylight Control Required</div> <div>Daylight Control Not Required</div>	Key Exceptions <ul style="list-style-type: none">• Healthcare facility direct patient care areas• Retail sidelit zones on the first floor• Where sidelight fenestration is < 24ft²• Where obstructions block daylight• Where visible transmittance is too low• Enclosed office spaces < 250ft²• Where overhang projection factor too large
Specific Application Controls C405.2.5 <ul style="list-style-type: none">• Manual control separate from general lighting• Auto off by timeswitch or occupancy sensor	Required for the Following Lighting <ul style="list-style-type: none">• Display & accent• Display cases• Food warming• Under shelf/cabinet• Lighting for sale/education• Galleries/museums• Supplemental task• Plant growth• Added power lighting	Key Exceptions <ul style="list-style-type: none">• None
Medical/Dental Task Lighting C405.2.5.3 <ul style="list-style-type: none">• When in addition to general lighting, provide with a manual control	Required for the Following Lighting <ul style="list-style-type: none">• Task lighting for medical purposes• Task lighting for dental purposes	Key Exceptions <ul style="list-style-type: none">• None

ADDITIONAL CONTROL REQUIREMENTS

Sleeping & dwelling units in hotels & timeshares C405.2.10.1 <ul style="list-style-type: none">• At least two switched receptacles in each room except bathrooms, kitchens, foyers, hallways, closets• Auto off all permanent luminaires and switched receptacles within 20 minutes of occupants leaving	Key Exceptions <ul style="list-style-type: none">• Captive key override may be used for auto off in spaces with five or fewer permanently installed lights and switched receptacles
Sleeping units in congregate living C405.2.10.2 <ul style="list-style-type: none">• Provide occupancy sensor control in bathrooms which shuts off lighting within 20 minutes of occupants leaving• Provide labeled manual controls at all entrances which turn off all lighting and switched receptacles with the exception of bathrooms & kitchens	Key Exceptions <ul style="list-style-type: none">• None
Exterior Lighting Controls C405.2.7 <ul style="list-style-type: none">• Auto off when daylight available• Façade & landscape lights auto off up to one hour after business close to one hour before business open• All other lighting reduce power ≥ 50% no later than midnight to 6 AM, one hour after closing to one hour before opening, or when no activity for > 15 min• Parking lot lights > 40W with mounting heights ≤ 24ft must reduce power ≥ 50% when no activity detected for > 15 minutes. Control zone ≤ 1500W	Key Exceptions <ul style="list-style-type: none">• Covered vehicle entrance/exits where required for eye adaptation• Lighting controlled from within a dwelling unit
Interior Parking Area Lighting Controls C405.2.9 <ul style="list-style-type: none">• Automatic lighting shut off by occupancy sensor control C405.2.1.1 or timeswitch control C405.2.2.1• Automatically reduce lighting power ≥ 30% when no activity within 20 minutes, control zone ≤ 3,600ft²• Covered vehicle entrances and exits with eye adaptation lighting, reduce lighting by ≥ 50% from sunset to sunrise• Within 20ft of perimeter wall openings, automatically reduce lighting power ≤ 50% in response to daylight	Key Exceptions for Automatic Light Reduction <ul style="list-style-type: none">• In lighting zones with less than 1.5 FC at the darkest point Key Exceptions for Daylighting <ul style="list-style-type: none">• Where opening-to-wall ratio < 40%• Where distance from blocking obstruction is less than one half the obstruction height• Where screens or architectural elements obstruct daylight entering the space
Automatic Receptacle Control C405.12 <p>Applies to ≥ 50% of receptacles in enclosed offices, conference rooms, copy/print rooms, breakrooms, classrooms, individual workstations and ≥ 25% of feeders for modular furniture not on plans</p> <ul style="list-style-type: none">• Auto off by either:<ol style="list-style-type: none">1. Time schedule, ≤ 2 hour override, control area ≤ 5,000ft²2. Occupancy sensor with 20 minute off delay3. Automated signal that shall auto off receptacles within 20 minutes of occupants leaving• Either top duplex receptacle controlled or controlled receptacle within 12 inches of uncontrolled receptacle• Controlled receptacles permanently marked in accordance with NFPA 70• Plug in controlled power strips and devices do not comply	Key Exceptions <ul style="list-style-type: none">• Equipment continuously operating 24/7• Where auto control would endanger safety or security• In a modular office workstation a controlled outlet may be mounted up to 72 inches from an uncontrolled outlet of the workstation
Electrical Energy Monitoring C408.13 <ul style="list-style-type: none">• Measure, monitor, record and report electrical energy consumption• Record 15 min intervals minimum• Report at least hourly, daily, monthly, annually• Store energy data for ≥ 36 months• Graphically provided energy reports by end use• No more than 5% mix of end use energy category Measure and report separately for: <ul style="list-style-type: none">• Total HVAC system• Interior lighting• Exterior lighting• Plug load• Process load• Operations and other miscellaneous loads• Electric hot water heating	Key Exceptions <ul style="list-style-type: none">• Buildings < 10,000 ft²• R-2 occupancy buildings• Tenant spaces < 5,000 ft²
Additional Efficiency & Load Management Requirements C406.1 <p>Achieve the required credits for additional energy efficiency and load management per building occupancy group and climate zone found in Tables C406.1.1(I) & C406.1.2</p> <div>Lighting efficiency credit options:<ul style="list-style-type: none">• L02 - Dimming & tuning• L03 - Increased occupancy sensor control use• L04 - Increased daylight area controls• L05 - Residential lighting controls• L06 - Reduced lighting power</div> <div>Lighting load management options:<ul style="list-style-type: none">• G01 - Lighting load management control</div>	Key Exceptions <ul style="list-style-type: none">• Buildings < 2000 ft²• Buildings < 5000 ft² comply with only the efficiency requirements• Build-out construction of a core & shell < 1000ft²
Lighting System and Receptacle Control Functional Testing C408.3 <ul style="list-style-type: none">• Before passing final inspection, the registered design professional or approved agency provides evidence that lighting controls and automatic receptacle controls have been tested, calibrated, adjusted, programmed, and in proper working condition• Provide owner documents certifying lighting controls meet performance criteria within 90 days after certificate of occupancy	Key Exceptions <ul style="list-style-type: none">• None