

IECC®: C405.3.1, C405.5.1

Proponents:

Glenn Heinmiller, representing International Association of Lighting Designers (glenn@lampartners.com)

2021 International Energy Conservation Code

Revise as follows:

C405.3.1 Total connected interior lighting power.

The total connected interior lighting power shall be determined in accordance with Equation 4-10.

$$TCLP = [LVL + BLL + LED + TRK + Other]$$

(Equation 4-10)

where:

TCLP = Total connected lighting power (watts).

LVL = For luminaires with lamps connected directly to building power, such as line voltage lamps, the rated wattage of the lamp.

BLL = For luminaires incorporating a ballast or transformer, the rated input wattage of the ballast or transformer when operating that lamp.

LED = For light-emitting diode luminaires with either integral or remote drivers, the rated wattage of the luminaire.

TRK = For lighting track, cable conductor, rail conductor, and plug-in busway systems that allow the addition and relocation of luminaires without rewiring, the wattage shall be one of the following:

1. The specified wattage of the luminaires, but not less than 8 W per linear foot (25 W/lin m).
2. The wattage limit of the permanent current-limiting devices protecting the system.
3. The wattage limit of the transformer supplying the system.

Other = The wattage of all other luminaires and lighting sources not covered previously and associated with interior lighting verified by data supplied by the manufacturer or other *approved* sources.

The connected power associated with the following lighting equipment and applications is not included in calculating total connected lighting power.

~~1. Television broadcast lighting for playing areas in sports arenas.~~

~~2.~~
1. Emergency lighting automatically off during normal building operation.

~~3.~~
2. Lighting in spaces specifically designed for use by occupants with special lighting needs, including those with visual impairment and other medical and age-related issues.

~~4.~~
3. Casino gaming areas.

~~5.~~ Mirror lighting in makeup or dressing rooms, areas used for video broadcasting, video or film recording, or live theatrical and

4. music performance.

~~6~~
5. Task lighting for medical and dental purposes that is in addition to general lighting.

~~7~~
6. Display lighting for exhibits in galleries, museums and monuments that is in addition to general lighting.

~~8~~ Lighting for theatrical purposes, including performance, stage, film production and video production. Lighting in any location that is specifically used for video broadcasting, video or film recording, or live theatrical and music performance

~~9~~
8. Lighting for photographic processes.

~~10~~
9. Lighting integral to equipment or instrumentation and installed by the manufacturer.

~~11~~
10. Task lighting for plant growth or maintenance.

~~12~~
11. Advertising signage or directional signage.

~~13~~
12. Lighting for food warming.

~~14~~
13. Lighting equipment that is for sale.

~~15~~
14. Lighting demonstration equipment in lighting education facilities.

~~16~~
15. Lighting approved because of safety considerations.

~~17~~
16. Lighting in retail display windows, provided that the display area is enclosed by ceiling-height partitions.

~~18~~
17. Furniture-mounted supplemental task lighting that is controlled by automatic shutoff.

~~19~~
18. Exit signs.

~~20~~
19. Antimicrobial lighting used for the sole purpose of disinfecting a space.

C405.5.1 Total connected exterior building exterior lighting power.

The total exterior connected lighting power shall be the total maximum rated wattage of all lighting that is powered through the energy service for the building.

Exception: Lighting used for the following applications shall not be included.

1. Lighting *approved* because of safety considerations.
2. Emergency lighting automatically off during normal business operation.
3. Exit signs.
4. Specialized signal, directional and marker lighting associated with transportation.

5. Advertising signage or directional signage.
6. Integral to equipment or instrumentation and installed by its manufacturer.
7. ~~Theatrical purposes, including performance, stage, film production and video production.~~ Lighting in any location that is specifically used for video broadcasting, video or film recording, or live theatrical and music performance
8. Athletic playing areas.
9. Temporary lighting.
10. Industrial production, material handling, transportation sites and associated storage areas.
11. Theme elements in theme/amusement parks.
12. Used to highlight features of art, public monuments and the national flag.
13. Lighting for water features and swimming pools.
14. Lighting controlled from within dwelling units, where the lighting complies with Section R404.1.

15. Lighting of the exterior means of egress as required by the International Building Code

Reason Statement:

This proposal clarifies the exemption from interior and exterior lighting power requirements for the lighting for dressing room mirrors and for video production and live performance.

- C405.3.1 #1 is consolidated into revised #8
- C405.3.1 #5 is revised to clarify that this only applies to mirror lighting in dressing areas used for video and performance, not mirrors in retail dressing/fitting rooms. Retail dressing room mirror lighting is covered by the lighting power allowance in Table C405.3.2(2)
- C405.3.1 #8 is revised to clarify the exemption by using more accurate terms and clear language
- C405.5.1 #7 is revised to clarify the exemption by using more accurate terms and clear language

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

This is a clarification of code requirements and does not change intent or stringency

CEPI-177-21

Reason for modification:

Building exterior walkways, stairs, terraces, etc. are sometimes part of the building means of egress per IBC. The light levels required by the IBC for lighting of the means of egress are roughly 5 to 10 times higher than would normally be used for these outdoor applications. Without this exception it could be impossible to simultaneously meet the lighting power requirements of the IECC and meet the light level requirements of the IBC.

CEPI-1-21

IECC LLC_C402.1.3_Car wash buildings (514)

IECC®: CHAPTER 2 [CE], SECTION C202, (New), C402.1.3 (New)

Proponents: Darren Meyers, P.E., representing International Energy Conservation Consultants LLC (dmeyers@ieccode.com)

2021 International Energy Conservation Code

CHAPTER 2 [CE] DEFINITIONS SECTION C202 GENERAL DEFINITIONS

Add new definition as follows:

PROCESS APPLICATION. A manufacturing, industrial, or commercial procedure or activity where the primary purpose is the use of process energy in appliances, equipment, controls and systems other than those for ventilating and conditioning spaces ~~and maintaining comfort, lighting or service water heating and amenities~~ for the occupants of a building.

PROCESS ENERGY. Energy ~~consumed~~ used in support of a *process application*.

Add new text as follows:

C402.1.3 Car wash facilities. Free-standing and appurtenant *manual or automatic* car wash facilities or portions thereof, considered a process application, ~~facilities or portions thereof~~ and separated from *conditioned spaces* by *building thermal envelope* assemblies complying with C402.1.3 or C402.1.4 or C402.1.5 or C407, shall be exempt from *building thermal envelope* provisions of Section C402; ~~the interior lighting control provisions of Sections C405.2.1, C405.2.2, C405.2.3; and the interior lighting power provisions of Section C405.3.~~

C405.1.2 Lighting in car wash facilities. Car wash facilities or portions thereof, considered a process application and separated from conditioned spaces shall comply with Sections C405.2.2 and C405.2.6."

Revise text as follows:

C405.1 General (Mandatory). Lighting system controls, the maximum lighting power for interior and exterior applications, and electrical energy consumption shall comply with this section. *Sleeping units* shall comply with Section C405.2.5 and with either Section C405.1.1 or C405.3. Lighting in car wash facilities or portions thereof, considered a process application and separated from conditioned spaces, shall comply with Section C405.1.2. General lighting shall consist of all lighting included when calculating the total connected interior lighting power in accordance with Section C405.3.1 and which does not require specific application controls in accordance with Section C405.2.5.

Transformers, uninterruptable power supplies, motors and electrical power processing equipment in data center systems shall comply with Section 8 of ASHRAE 90.4 in addition to this code.

C405.3.1 Total Connected interior lighting power. The total connected interior lighting power shall be determined in accordance with Equation 4-10.

[[No change to Equation 4-10]]

The connected power associated with the following lighting equipment and applications is not included in calculating total connected lighting power.

[[Add only a new Exception 21]]

21. Lighting in car wash facilities or portions thereof, considered a process application and separated from conditioned spaces.

Reason: The code does not intend to regulate the use of process energy in commercial applications such as those associated with a car wash facility in the same way it does for the ventilation and conditioning of spaces for the comfort and amenities of building occupants or the illumination of such spaces for the visual acuity of building occupants (to read, work, eat or play) or the heating of water to remove sand, salt and debris from vehicles. Moreover, the equipment (applicators, blowers, filters, sumps, sprayers, washers, scrubbers and conveyors) utilized for car washing applications tend to break down, freeze or fail, prematurely if they are not provided with a minimum level of heat for operational performance of said equipment.

This proposal targets car wash facilities, specifically. The level of ventilation and space conditioning for a car wash facility is not designed for human comfort, heating or cooling, but rather to bear the commercial enterprise and operational performance of a car wash facility. Such facilities have their own, unique challenges across hot, cold and transitional climates. Vehicle owners do not need the level of illumination necessary to read, work, eat or play during the 2-5 minutes they (in or apart from their vehicle) are proceeding through the wash cycle. Hence, there is no pragmatic or feasible reason to require building insulation, window U-factor/SHGC, air-leakage control, interior lighting power, daylight responsive controls, occupancy-vacancy sensing or interior lighting shut-off control for these facilities.

Cost Impact: The code change proposal will decrease the cost of construction. There is no cost implication aligned with this proposal. The resulting exclusions would mean the process application energies assigned to car washing equipment would be "excluded" from the scope and applicability of the IECC. No change to stringency is proposed.

TABLE. CONDITIONED SPACE ADDER

Condition	IECC-Commercial	ASHRAE 90.1
Conditioned Space	<p>Defined</p> <p>“Enclosed w/in the <i>building thermal envelope</i> and directly or indirectly heated or cooled.”</p> <p>Provided w/ “... a peak design rate of energy usage greater than or equal to 3.4 Btuh/ft² (1.0 W/ft²)”</p>	<p>Defined ... see “<i>space</i>”</p> <p>“A <i>cooled space, heated space or indirectly conditioned space</i> ...”</p>
Heated Space (<i>Heated</i>)	<p>Not defined</p> <p>Provided w/ “... a peak design rate of energy usage greater than or equal to 3.4 Btuh/ft² (1.0 W/ft²)”</p>	<p>Defined ... see “<i>space</i>”</p> <p>“... heated by a heating system w/ output capacity relative to floor area => Table 3.2”</p> <p>(See 90.1-2019, Table 3.2)</p>
Cooled Space (<i>Cooled</i>)	<p>Not defined</p> <p>Provided w/ “... a peak design rate of energy usage greater than or equal to 3.4 Btuh/ft² (1.0 W/ft²)”</p>	<p>Defined ... see “<i>space</i>”</p> <p>“... cooled by a cooling system w/ a sensible output capacity relative to floor area greater than or equal to 3.4 Btuh/ft² (1.0 W/ft²)”</p>
Semi-Heated Space	<p>Not scoped</p> <p>Spaces are either “greater than or equal to 3.4 Btuh/ft² (1.0 W/ft²)” or they are not. Hence, they are either “conditioned” and thereby subject to envelope provisions, or they are not.</p>	<p>Defined ... see “<i>space</i>”</p> <p>“... heated by a heating system w/ an output capacity relative to floor area greater than or equal to 3.4 Btuh/ft² (1.0 W/ft²), but not <i>conditioned space</i>”</p> <p>(See 90.1-2019, Table 3.2)</p>
* Equipment Buildings	<p>Not defined</p> <p>Specific provisions via C402.1.2</p> <ul style="list-style-type: none"> - Separate building - Heated at or below 50F (10C) - No more than 17,000 Btuh (5 kW) - No cooling limit 	<p>Not scoped</p> <p>2.3 “Where specifically noted in this standard, certain other <i>buildings</i> or elements of <i>buildings</i> shall be exempt.”</p> <p>Unenclosed/unconditioned spaces:</p> <ul style="list-style-type: none"> - Cooled spaces < 3.4 Btuh/ft² (1.0 W/ft²) - Heated spaces < 3.4 Btuh/ft² (1.0 W/ft²) - Open parking garages - Naturally ventilated crawls, attics

* Table “Conditioned Space Adder” Copyright, 2022 International Energy Conservation Consultants, LLC.

Modifications to CEPI-136

C405.1.1 Lighting for dwelling units.

No less than 90 percent of the permanently installed lighting serving dwelling units, excluding kitchen appliance lighting, shall be provided by lamps with an efficacy of not less than 65 lm/W or luminaires with an efficacy of not less than 50 lm/W.

Exception: Luminaires with continuously variable color temperature capability that is controlled by a control that is separate from the luminaire.

Modification to CEPI-137

C405.1.1 Lighting for dwelling units.

No less than 90 percent of the permanently installed lighting serving dwelling units, ~~excluding kitchen appliance lighting,~~ shall be provided by lamps with an efficacy of not less than 65 lm/W or luminaires with an efficacy of not less than 45 lm/W, or shall comply with Sections C405.2.4 and C405.3.

Exceptions:

1. Kitchen appliance lighting.
2. Antimicrobial lighting used for the sole purpose of disinfecting.

Reason: Approval of the modified CEPI-137 would align with the action taken by the IECC-R Electrical, Power, Lighting and Renewable Energy Subcommittee on February 28 to approve REPI-101 as follows:

R404.1 Lighting equipment. All permanently installed lighting fixtures, ~~excluding kitchen appliance lighting fixtures,~~ shall contain only high-efficacy lighting sources.

Exceptions:

1. Kitchen appliance lighting.
2. Antimicrobial lighting used for the sole purpose of disinfecting.

Modification to CEPI-176

C405.2.9 Demand responsive lighting controls. New buildings shall install controls that are capable of automatically reducing general lighting power by at least 15% in response to a demand response signal.

Exceptions:

1. Buildings with less than 4,000 watts of combined installed general lighting power in spaces that have more than 0.5 W/ft² of lighting power.
2. Buildings in jurisdictions where the utilities don't offer demand response programs.

C406.1 Additional energy efficiency credit requirements.

New buildings shall achieve a total of 10 credits from Tables C406.1(1) through C406.1(5) where the table is selected based on the use group of the building and from credit calculations as specified in relevant subsections of Section C406. Where a building contains multiple-use groups, credits from each use group shall be weighted by floor area of each group to determine the weighted average building credit. Credits from the tables or calculation shall be achieved where a building complies with one or more of the following:

...

12. Where not required by Section C405.2.9, include demand responsive lighting controls compliant with C405.2.9.