

**General**

There are several areas in the forms where the user is asked to identify the location on plans or specifications where a requirement is called out. For instance Line 4 asks the user to identify compliance details for daylighting requirements. The user should input which drawing number and detail shows the daylight controller, controlled fixtures, and photocell, and what section and subsection of specifications identifies the required control sequence. This is meant to enable the plan reviewer to easily verify compliance.

***Should I use the Tenant Space Method (Form 5b) or the Space by Space Method (Form 5c)?***

Both methods establish a lighting power budget for the building. The Tenant Space method is the simpler of the two methods, while the Space by Space Method may provide a higher lighting power budget for some buildings. The Space by Space method will require entering areas for each room in the project. It will also require determining what each room's Space Type Category is (from Table 3b). See discussion of Forms 5b and 5c for more detail about the two methods).

When utilizing the Retail Display Lighting Power allowance, the Space by Space Method must be used.

***Excel Spreadsheet Users Note:*** Users of the Excel spreadsheet may wish to fill out all required information for Space by Space Method on Worksheet 5b. This will enable the user to check compliance using either method on Form 5a.

**Line 1. Exceptions**

**No Interior Lighting.** If your building plans do not call for new or altered interior lighting, check this box and go to Item 5, Exterior Building Lighting – General. If there is no exterior building lighting to be installed, these forms are not required.

**Exceptions.** Section 1313.1 allows a number of exceptions to the code requirements for interior lighting:

1. Lighting for the following areas:
  - 1.1. Outdoor athletic facilities.
  - 1.2. Dwelling units, lodging houses, one or two family dwellings and guest rooms.

- 1.3. Industrial plants—manufacturing spaces only.
- 1.4. Paint shops and painting spray booths.
- 1.5. High-risk security areas such as detention facilities, automatic teller machines (ATMs), and night drops.
- 1.6. Areas specifically designed for visually disabled people.
- 1.7. Tunnels.

2. Lighting equipment used for the following shall be exempt provided that it is **in addition to general lighting** and is **controlled by an independent control device**:

- 2.1 Production lighting for theatrical, television, spectator sports and like performance areas.
- 2.2 Decorative, special effect and production lighting for those portions of entertainment facilities such as theme parks, night clubs, discos and casinos where lighting is an essential technical element for the function performed.
- 2.3 Lighting equipment that is for sale.
- 2.4 Task lighting for medical and dental purposes.
- 2.5 Bench lighting for research laboratories.
- 2.6 Lighting to be used solely for indoor plant growth during the hours of 10 p.m. to 6 a.m.
- 2.7 Emergency lighting that is automatically off during normal building operation.
- 2.8 Art accent lighting required for art exhibits or displays in galleries, museums and monuments.
- 2.9 Sign lighting.
- 2.10 Nonpermanent lighting.

If the project qualifies for one of these exceptions, enter section and exception number. For example, if you claim an exception for paint booth, under the appropriate exception category, enter Exception 1.4. Next, describe the area(s) of the building that qualify for the exception. Paint booth – Room 104.

Exception 2.1 is specifically for production lighting used for performance of productions, such as theatrical spotlights highlighting a stage. This exception would not apply to production lighting used in a non-production task such as theatrical spotlights used in a retail environment.

Exception 2.4 is specifically for medical and dental task lighting. An example would be a light used by a dentist that shines into the mouth or the light in an X-ray viewing panel.

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Exception 2.9 is specifically for lighting used only for signage and is controlled by an independent control device. This does not include perimeter-wall lighting.

Exception 2.10 is for lighting that is not part of the permanent building lighting systems. This would include plugged-in under shelf lighting in modular office furniture or plugged-in under shelf lighting in modular retail shelving. Lighting in cases, such as in grocery store upright freezers and within display cases, such as for jewelry are considered nonpermanent lighting. Examples of plug-in lighting that would be considered part of the building lighting system for inclusion in Lighting Power Allowance include metal halide fixtures and clamp-on (and plugged-in) theatrical-type lighting used in spaces that are not for theatrical purposes.

Additions and alterations must comply with the code, but there are exceptions to that rule. Section 1313.6 covers the requirements and exceptions that apply to additions and alterations.

Alterations are exempt from the performance (power) requirements of the code if the alterations to existing lighting systems do not replace more than 50 percent of the luminaires in the permitted project **and** do not increase the existing total connected lighting power. This exception allows unlimited movement of existing luminaires and limited replacements or additions to the light fixtures. Also, new lighting controls must meet new code controls requirements.

If your building plans call for altered building lighting and you want to claim this exception, enter Section 1313.6, Exception. Next, describe the area(s) of the building that qualify for an exception.

## Line 2. Local Shut-off Controls

**Complies.** The code requires that most spaces have some means for turning lights on and off. A wall toggle switch, an occupancy sensor or a dimmer can meet this requirement. The control must be within the room and available to the room occupants, and it cannot cover an area larger than 2,000 square feet. For example, a 3,000 square foot area must have at least two controls.

**Exceptions.** Section 1313.3.1.1 allows four exceptions to the code requirement for local shut-off controls.

1. Lighting for warehouses, parking garages or spaces using less than 0.5 Watts/ft<sup>2</sup>.
2. Lighting systems serving areas that must be continuously lit.
3. Public areas, such as concourses, with switches that are accessible only to authorized personnel.
4. Lighting for contiguous, single-tenant retail spaces.

If your project qualifies for one of these exceptions, enter the section and exception number. For example, if you claim an exception for lighting for a public restroom, enter Section 1313.3.1.1, Exception 3. Next, describe the area(s) of the building that qualify for the exception.

If your project is an existing building with existing local shutoff controls that meet these requirements, select complies. If your project is an existing building where lighting controls or distribution wiring is not being installed or replaced, leave these spaces blank.

## Line 3. Automatic shutoff control

**Not Applicable.** If the permitted space is less than 5,000 square feet, **and** there are no office areas greater than 2,000 square feet of contiguous floor area, **and** there are no offices less than 300 square feet, **and** no meeting or conference rooms, **and** no school classrooms, check this box.

**Complies.** All buildings greater than 5,000 square feet **and** all offices over 2,000 square feet of contiguous floor area must be equipped with a separate automatic control to shut off the lighting. Automatic controls may include **occupancy sensors** (that comply with Section 1313.3.1.2.1), **automatic time switches** (that comply with 1313.3.1.2.2) or other devices capable of automatically shutting off the lighting during normally unoccupied periods.

Additionally, all offices less than 300 square feet, all meeting and conference rooms, and all school classrooms, are required to be equipped with **occupancy sensors** that comply with Section 1313.3.1.2.1. This requirement is regardless of building size.

If your project complies with these requirements, check complies and indicate where on the plans or specifications the automatic shutoff controls

**Line 1  
Exceptions –  
cont.**

**Automatic  
Shutoff  
Control**

**Local  
Shutoff  
Controls**

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**Automatic Shutoff Control – cont.** are called out. For example – Sheet E1.3 and Section 16510.4.3.C. If your project is an existing building where lighting controls or distribution wiring is not being installed or replaced, select not applicable.

**Exceptions.** Some lighting applications, because of safety or functional concerns, need not be automatically controlled. The code has seven exceptions to the requirement for automatic shut-off controls:

### Daylighting Controls

1. Emergency and pathway lights as required by code.
2. Where the system is serving an area that must be continuously lit.
3. Display and accent lighting, including plug-in, track and display case lighting, shall be separately controlled.
4. Switching for industrial or manufacturing process facilities as may be required for production.
5. Hospitals and laboratory spaces.
6. Areas in which medical or dental tasks are performed.
7. Mechanical and electrical equipment rooms

If your project qualifies for one of these exceptions, enter the Section and Exception number. For example, if you have an area that must be continuously lit, such as a hotel lobby, and you do not want automatic shut-off controls, enter Section 1313.3.1.1.2, Exception 2. Next, describe the area(s) of the building that qualify for the exception.

The Code defines occupancy sensors and automatic time switches as follows:

**Occupancy Sensors.** Occupancy sensors shall be capable of automatically turning off all the lights in an area, no more than 30 minutes after the area has been vacated. Lighting fixtures controlled by occupancy sensors shall have a wall-mounted, manual switch capable of turning on and off lights when the space is occupied.

**Automatic Time Switches.** Automatic time switches shall have a minimum 7-day clock and be capable of being set for 7 different day types per week and incorporate an automatic holiday "shut-off" feature, which turns off all loads for at least 24 hours and then resumes normally scheduled operations. Automatic time switches shall also have program back-up capabilities, which prevent the loss of program and time settings for at least 10 hours, if power is interrupted.

Automatic time switches shall incorporate an over-ride switching device which:

1. is readily accessible,
2. is located so that a person using the device can see the effects of the control,
3. is manually operated,
4. allows the lighting to remain on for no more than 2 hours when an over-ride is initiated,
5. controls an area not exceeding 2,000 ft<sup>2</sup>.

### Line 4. Daylighting Controls

**No Classrooms or atriums with skylights or window-to-wall ratio greater than 50%.** If the building does not contain any classroom or atrium with either a window to exterior wall ratio of at least 50% or any amount of skylight, check this box.

**Complies.** All classrooms and atriums with a window-to-exterior wall ratio exceeding 50 percent or with any amount of skylights are required to install automatic daylight sensing controls meeting all the requirements listed in this section. If daylighting controls are included and meet these requirements, check complies, and identify the location in the plans and *specific location within* specifications where the daylighting controls are specified. For example – Sheet E1.3 and Section 16510.4.3.C.

**Classrooms/atriums with windows:** Class-rooms and atriums with a window to exterior wall ratio of 50% or greater shall use automatic daylight sensing controls for all permanently installed luminaries 15 feet inward and 5 feet on each side of the windows. For the purpose of this section, window-to-wall ratio is measured on inside of room, on exterior walls.

**Classrooms/atriums with skylights:** In classrooms and atriums with skylights, monitors, or other fenestration at or above ceiling level, all permanent luminaries within an area equal to the footprint of the ceiling opening plus the floor to ceiling height in each direction of the opening, shall be controlled by automatic daylight sensing controls.

The Code requires that automatic daylight sensing controls:

1. Be capable of reducing the light output of the controlled luminaries by at least one half while maintaining a uniform level of illuminance,
2. Provide continuous dimming of the controlled luminaries,

# LIGHTING – GENERAL

- 3. Control only luminaires within the daylight area, and
- 4. Incorporate time-delay circuits to prevent cycling of light level changes of less than three minutes.

**Exception:** Atriums can utilize step switching or other non-continuous dimming devices provided they have adjustable separation (deadband) of on and off points to prevent short cycling.

## Line 5. Exterior Building Lighting Power

**Complies.** If the building plans do not call for lighting the exterior of the building with incandescent or mercury vapor lights, check this box. This requirement promotes the more efficient lighting sources such as fluorescent and metal halide.

**Exception.** This exception allows the use of incandescent or mercury vapor lamps, but only for swimming pools, water features, and other locations subject to the requirements of Article 680 of the 2002 National Electrical Code.

**Note.** If the building has a parking garage or an exterior canopy, complete Worksheet 5c.

If your project does not contain any exterior building lighting, check the **Complies** box.

## Line 6. Exterior and Canopy Lighting Controls

**Complies.** Section 1313.3.2 states that exterior building lighting be automatically controlled by a timer or photocell or both, which is designed and programmed to extinguish lights when daylight is present.

Clock switches must be astronomic (seasonal correcting) type with separate programs for each day of the week and must store energy to maintain time keeping during power outages.

A motion sensor, if used, must employ a photo-electric switch to prevent operation during daytime.

If your project meets these requirements, check complies. If your project does not contain any exterior building or canopy lighting, leave these spaces blank.

## Line 7. Connected Lighting Power

**Complies.** The building lighting power shall not exceed the interior power allowance established in either the Tenant Space Method or the Space-by-Space Method. Select either “Tenant Space Method” or “Space-by-Space Method,” whichever is used to demonstrate compliance. Insert **YES** if project complies and **NO** if project does not comply with the appropriate method. If the building has illuminated exterior canopies or a parking garage, those must also comply and the resultant answer must be **YES**.

Where multiple, independently operating lighting systems serve the same space and are controlled to prevent simultaneous operation, connected lighting power shall be based only on system with highest connected lighting power.

**Excel Spreadsheet Notes:** By selecting either “Tenant Space Method” or “Space-by-Space Method,” the appropriate Form will become available and a “Yes” or “No” will be automatically generated based on inputs provided.

**Daylighting Controls – cont.**

**Interior & Exterior Lighting Power**

**Exterior & Canopy Lighting Controls**

# INTERIOR LIGHTING POWER – TENANT SPACE METHOD

## The Tenant Space Method - Form 5b

Form 5b, based on the Tenant Space Method, is the simpler of two methods in the code for setting a building's interior lighting power budget. The other method is the Space-by-Space Method. The Space-by-Space Method is described later in these instructions.

The Tenant Space Method is a combined space method where the lighting power budget for an entire building or tenant space is the product of the Maximum Power Density (Watts per ft<sup>2</sup>) and area of the occupancy (ft<sup>2</sup>), expressed in Watts. The budget may be distributed throughout the building in any way a designer chooses (traded off), so long as total tenant space or building budget is not exceeded.

If a building or tenant space does not comply

with the assigned budget for the predominant occupancy, or there are many spaces that require a higher budget than the predominant use (such as offices adjoining warehouse, which is the predominant use), the Space-by-Space Method may provide a higher budget.

If the building contains any retail display lighting and that code provision is to be utilized, you must use the Space-by-Space Method.

Unused wattage inside a building cannot be used to increase the exterior building lighting power.

Example:  
 Budget (column (d)) = Max. Power Density (column (c)) x Floor Area (column (b))

### Example

(a) Tenant or Building Type (Table-13G)	(b) Floor Area (sq ft)	(c) Max Power Density (W/ft <sup>2</sup> )	(d) Lighting Power Budget (W)
Office	10,000	1.0	10,000
<b>1. Total Interior Lighting Power Budget (Watts) for Building.</b>			<b>10,000</b>

**Tenant or Building Type (a).** Enter the appropriate tenant or building type from Table 5a. Table 5a consists of Table 13-G from the Building Code and provides a list of tenant space or building types for use in Tenant Space Method. If a building or tenant space has multiple occupancies, the budget for building or tenant space is determined by the predominant occupancy.

**Floor Area (b).** Enter the floor area for entire building or tenant space. (Floor area is measured from the outside surface of exterior walls, and from center of interior partition walls.)

**Maximum Power Density (c)** From Table 5a enter the appropriate Lighting Power Density (Watts/ft<sup>2</sup>), for the tenant or building type. *Excel spreadsheet automatically enters this value.*

**Lighting Power Budget.** Budget (d) = (b) x (c). *Excel spreadsheet automatically calculates this value.*

**Line 1.** Enter the value from column (d) above – results of formula. *Excel spreadsheet calculates automatically.*

# INTERIOR LIGHTING POWER – TENANT SPACE METHOD

2.	Total length of track lighting (ft)	20
3.	Line 2 multiplied by 50 Watts/ft	1,000
4.	Total amperage of circuit breaker(s) serving track lighting (amps)	15
5.	Voltage of circuit breaker serving track lighting (volts)	120
6.	Maximum wattage of track lighting (multiply line 4 by line 5)	1,800
7.	VA rating of the inline current limiter or the low voltage transformers	800
8.	Track Lighting Power (the lesser value of line 3, 6 or 7)	800

**Example**

**Lines 2 through 8**

The code requires that lighting power used for track lighting be calculated as either 50 Watts per linear foot or maximum circuit load of over-current protection device (circuit breaker) serving track lighting, or inline current limiter or low voltage transformers whichever is less. See section 1313.2.3.

**Line 2.** Sum and enter the total lineal footage of all track lighting from Worksheet 5b.

**Line 3.** Multiply Line 2 by 50 W/linear ft.

**Line 4.** Enter the total amperage of the circuit breakers serving the track lighting circuits.

**Line 5.** Enter the voltage circuit breakers serving the track lighting circuits.

**Line 6.** Enter the product of line 4 multiplied by line 5.

**Line 7.** If the track lighting system includes low voltage transformers or in-line current limiters you may enter the sum of the listed VA rating values for the inline current limiters or low voltage transformers in line 6. Leave this cell blank if an inline current limiter or low voltage transformer is not used.

**Line 8.** Enter the lesser of the values from line 3 or line 6 or line 7.

9.	Total Interior Lighting Power from Worksheet 5b-1 (Sum of Column (m))	+	8,990
10.	<b>Total Adjusted Interior Lighting Power</b> (line 8 + line 9)	=	<b>9,790</b>
11.	<b>Does Interior Lighting Design Meet Budget?</b> Line 10 must be no greater than line 1.		<b>YES</b>

**Example**

**Line 9.** Enter the value from Worksheet 5b-1 (Sum of Column (m)).

**Excel Spreadsheet Notes:** Lines 8 & 9 will be calculated automatically. Line 9 will not include fixtures identified as track lighting or fixtures identified as exempt.

**Excel Spreadsheet Notes:** Lines 2, 3, 6, 10, & 11 will be calculated automatically.

**Line 11.** If line 10 is equal to or less than line 1, insert "YES" or "NO" if line 10 is greater than line 1.

**Excel Spreadsheet Note:** The value for Line 11 will be automatically propagated.

**Line 10.** Enter the total interior lighting power from line 8 and line 9.

12.	<b>Do Exterior Canopies Meet Budget</b> (Worksheets 5c)?	<b>YES</b>
13.	<b>Does Parking Garage Meet Budget</b> (Worksheets 5c)?	<b>YES</b>

**Line 12.** Whenever there are lighted exterior canopies, complete Worksheet 5c. If total of Worksheet 5c, column (k) is equal to or less than total of column (e), insert "YES" or "NO" if total of column (k) is greater than total of column (e) in line 12.

**Line 13.** Whenever there are lighted parking garages, complete Worksheet 5c. If total of Worksheet 5c, column (k) is equal to or less than total of column (e), insert "YES" or "NO" if total of column (k) is greater than total of column (e) in line 13.

**Excel Spreadsheet Notes:** Lines 12, & 13 will be automatically propagated.

# INTERIOR LIGHTING POWER – SPACE-BY- SPACE METHOD

## The Space-by-Space Method – Form 5c

While the Tenant Space Method is a more simple way to comply with code, Space-by-Space Method may provide a higher budget for certain projects. The Space-by-Space method is different from Tenant Space Method in the following ways:

The space-by-space method assigns a budget to each space in the project. The sum of those individual space budgets becomes the budget for the entire tenant space or building. Although a budget is established for each space type,

total may be distributed throughout the building in any way a designer chooses (traded off), so long as the total tenant space or building budget is not exceeded.

When utilizing the Retail Display Lighting Power Allowance, complete Worksheet 4d. This allowance can only be used within the retail sales floor area. Any unused wattage cannot be applied to the remainder of space types.

**Excel Spreadsheet Notes:** Worksheet 5d will automatically appear when the Space-by-Space radio button is checked on bottom of Form 5a.

### Example

1. Total Interior Lighting Power Budget from Worksheet 5b-1 (Sum of Column (I))	9,500
2. Total length of track lighting (ft)	20
3. Line 2 multiplied by 50 Watts/ft	1,000
4. Total amperage of circuit breaker(s) serving track lighting (amps)	15
5. Voltage of circuit breaker serving track lighting (volts)	120
6. Maximum wattage of track lighting (multiply line 4 by line 5)	1,800
7. VA rating of the inline current limiter or the low voltage transformers	800
8. Track Lighting Power (the lesser value of line 3, 6 or 7)	800

**Line 1.** Enter the lighting power budget from Worksheet 5b-1 (sum of column (I)).

**Excel Spreadsheet Note:** The value for Line 1 will be automatically calculated from total of all Worksheets 5b completed.

### Lines 2 through 8

The code requires that lighting power used for track lighting be calculated as either 50 Watts per linear foot or the maximum circuit load of the over-current protection device (circuit breaker) serving track lighting (when track lighting is served by separate breakers), or inline current limiter or low voltage transformers whichever is less. See section 1313.2.3.

**Line 2.** Sum and enter the total lineal footage of all track lighting from Worksheet 5b.

**Line 3.** Multiply Line 2 by 50 W/lf.

**Line 4.** Enter the total amperage of the circuit breakers serving the track lighting circuits.

**Line 5.** Enter the voltage circuit breakers serving the track lighting circuits.

**Line 6.** Enter the product of line 4 multiplied by line 5.

**Line 7.** If the track lighting system includes low voltage transformers or in-line current limiters you may enter the sum of the listed VA rating values for the inline current limiters or low voltage transformers in line 6. Leave this cell blank if an inline current limiter or low voltage transformer is not used.

**Line 8.** Enter the lesser of the values from line 3 or line 6 or line 7.

**Excel Spreadsheet Notes:** Lines 2, 3, 6, and 8 will be calculated automatically.

# INTERIOR LIGHTING POWER – SPACE-BY- SPACE METHOD

9. Total Interior Lighting Power from Worksheet 5b-1 (Sum of Column (m))	+	9,311
10. Total Adjusted Lighting Power (line 8 + line 9)	=	10,500
11. Does Interior Lighting Design Meet Budget? Line 10 must be no greater than line 1.		NO

**Example**

**Line 9.** Enter the total interior lighting power (excluding exempt fixtures and track lighting) from Worksheet 5b-1 (Sum of Column (m)).

**Line 10. Total Adjusted Lighting Power.** Enter the sum of line 8 plus line 9. Total Adjusted Lighting Power must be less than the building's budget as calculated in line 1 in order for your building to be in compliance.

**Excel Spreadsheet Notes:** Line 9 will be calculated automatically, and will not include fixtures identified as track lighting or fixtures identified as exempt.

**Line 11.** If line 10 is equal to or less than line 1, insert "YES" or "NO" if line 10 is greater than line 1.

**Excel Spreadsheet Notes:** The value for Line 10 will be automatically propagated.

12. Do Exterior Canopies Meet Budget (Worksheets 5c)?	YES
13. Does Parking Garage Meet Budget (Worksheets 5c)?	YES

**Line 12.** Whenever there are lighted exterior canopies, complete Worksheet 5c. If total of Worksheet 5c, column (k) is equal to or less than total of column (e), insert "YES" or "NO" if total of column (k) is greater than total of column (e) in line 12.

**Line 13.** Whenever there are lighted parking garages, complete Worksheet 5c. If total of Worksheet 5c, column (k) is equal to or less than total of column (e), insert "YES" or "NO" if total of column (k) is greater than total of column (e) in line 13.

**Excel Spreadsheet Notes:** Lines 12, & 13 will be automatically propagated.



# LIGHTING SCHEDULE

## Worksheet 5a

Worksheet 5a provides the plans examiner and inspector with a list of luminaires in the project and their power consumption. Fixture schedules usually describe luminaires in detail. They may include such items as types of luminaires, manufacturer model numbers, number of lamps,

and their voltage and wattage. However, they seldom indicate the power used by the luminaire.

It is essential to know the number of luminaires and their wattages in order to find the total installed or connected lighting load.

### Example

(a) Lum ID	(b) Luminaire		(c) Lamp		(d) Ballasts		(e) Luminaire Power (watts)	(f) Is Luminaire From Table 5c
	Type	Description	No.	Description	No.	Description		
	A	Fluorescent T8 - 4 foot	2-F32T8-ELECT NO-62W	2	F32T8	1	Electronic Normal Output. RS	62
B	Fluorescent T8 - 4 foot	3-F32T8-ELECT NO-93W	3	F32T8	1.5	Electronic Normal Output. RS	93	YES
C	Compact Fluorescent Twin	2-CFT5W/G23-MAG STD-18W	2	CFT5W/G23	2	Magnetic Standard	18	YES
D	User Defined	8-lamp CFL High Bay	8	CFT5W/E23	4	Magnetic Standard	72	NO
E	Track Lighting	Track Lighting	--	--	--	--	37.5	YES

**Column (a) - Luminaire Identification.** Use the letter or symbol that identifies each fixture type from the electrical plan or the lighting schedule.

**Column (b)-Luminaire Type and Description.** Describe the type of fixture. Luminaire types and descriptions are provided on Table 5c.

When fluorescent luminaires are used, be sure to include length of fixture in feet. When using fixture configurations not listed on Table 5c include the manufacturer's catalog cut-sheet, showing fixture wattage

**Excel Spreadsheet Note:** Column (c) will be automatically propagated based on user selection, unless a "User Defined" fixture is selected, in which case the number of lamps and description should be manually entered.

**Column (d) - Ballast Number and Description.** Enter the number and description or the abbreviations for the type of ballast. For fluorescent and high intensity discharge lamps, typical abbreviations are provided on Table 5c, examples include:

- MAG STD — standard magnetic
- MAG EE — energy efficient magnetic
- ELECT — electronic
- Elec NO — Electronic Normal Output
- Elec RO — Electronic Reduced Output
- Elec HO — Electronic High Output
- Elec Dim — Electronic Dimming

**Excel Spreadsheet Notes:** Luminaire type and description are available from pull down lists, representing all the fixtures in Table 5c. If the project contains a fixture not included in Table 5c, select "User Defined" for type and manually enter the fixture description.

**Column (c) - Lamp Number and Description**  
Enter the number and type of lamps in luminaire. Wattage of lamps is especially important information to provide. Use descriptions provided on Table 5c or lamp manufacturer's ordering codes (see Figure 5b for examples). They are fairly standard and usually contain all the required information. For fluorescent and high intensity discharge lamps, see Figure 5b for typical codes. Lamp descriptions are also provided on Table 5c. If track lighting is selected, do not enter any lamp number or description in column (c).

Fluorescent fixtures generally have one or more ballasts per fixture. Most HID luminaires have a single lamp per ballast. Most low voltage halogen luminaires have a single lamp per transformer. For fixtures without ballasts (such as incandescent), enter "none" in the description. When wiring for HID luminaires are plugged-in and mounted for ambient lighting, fixtures shall be considered permanently installed.

**Excel Spreadsheet Note:** Column (d) will be automatically propagated based on user selection, unless a "User Defined" fixture is selected, in which case the number of ballasts and description should be manually entered.

## LIGHTING SCHEDULE

**Column (e) - Luminaire Power.** For fluorescent and HID luminaires, enter the ballast input wattage for the lamp and ballast combination used in the luminaire. Table 5c provides default values for various lamp and ballast combinations.

When a particular lamp and ballast wiring combination is not in Table 5c, provide manufacturer's catalog cut-sheet showing tested values. See "How to Figure Luminaire Power From Catalog Cuts" in the Technical Notes section of this chapter, page 5-32.

For incandescent luminaires without transformers, multiply lamp wattage by number of lamps.

**Excel Spreadsheet Note:** The value for column (e) will be automatically propagated based on user selection, unless a "User Defined" fixture is selected, in which case the luminaire power should be manually entered.

**Column (f) - Data from Table 5b?** If your entry in column (e) is taken from Table 5b, enter "YES". If information in column (e) is from manufacturer's catalog cut-sheet enter "NO" in column (f). If NO is entered, be sure and attach manufacturer's catalog cut-sheet for each different fixture described.

**Excel Spreadsheet Note:** The result for column (f) will be automatically propagated.

# INTERIOR LIGHTING POWER

## Worksheet 5b

Worksheet 5b is used for both the Tenant Space Method and Space-by-Space Method.

Worksheet 5b is where you list all the luminaires in your project by room. This is used to calculate the total connected lighting power in your project. If using the Space-by-Space Method, this worksheet determines a lighting power

budget for the project. Additional copies of Worksheet 5a may be used if necessary.

**Excel Spreadsheet Note:** To automatically generate additional copies of Worksheet 5b, select the required number of additional worksheets from the pulldown box toward the bottom of the sheet.

### Example

(a)	Space-by-Space Method Only Skip to column (f) if using the Tenant Space Method				(f) Lum ID from Worksheet 5a Column (a)	(g) Quantity of Luminaires (or lineal ft. for track lighting)	(h) Luminaire Power (Watts)	(i) Exempt Fixtures
	(b) Area (ft <sup>2</sup> )	(c) Space Type (Table 13-H) (enter space type only once per room)	(d) Space Type LPD	(e) Lighting Power Budget (b) x (d)				
100	250	Office-enclosed	1.1	275	A	4	62	<input type="checkbox"/>
100			--	--	B	2	93	<input type="checkbox"/>
102	200	Office-enclosed	1.1	220	A	4	62	<input type="checkbox"/>
104	500	Museum - General Exhibition	1	500	A	10	62	<input type="checkbox"/>
104			--	--	C	5	18	<input checked="" type="checkbox"/>
104			--	--	E	100	38	<input checked="" type="checkbox"/>
105	75	Restrooms	0.9	68	C	2	18	<input type="checkbox"/>
			--	--			-	<input type="checkbox"/>

**Column (a) – Room ID.** Enter a short description for each room in column (a). In most instances, this will usually be a room number or other room ID. Do not leave any lines blank. If more than one luminaire type is in a room, that room will need multiple lines, so the same Room ID may be entered on several lines. If additional worksheets 5b are required, do not split individual rooms onto two separate worksheets.

description is not listed, use the most similar description. Example: Truck – Service/Repair is not listed but Automotive – Service/Repair would be used as it is the most similar description for that space.

**Excel Spreadsheet Note:** Space type for column (c) can be chosen from a pull-down list (but only after room ID or area is entered).

**Columns (b), (c), (d), and (e).** These columns only need to be filled out if the compliance method is the Space-By-Space method. Projects using the Tenant or Building Method may also fill in these columns, however it is not required. If you are unsure which method you wish to use, you may fill these columns in and calculate compliance using either method.

**Column (d) – Space Type LPD.** Enter the space type lighting power density for the room from Table 5a. Enter Space Type LPD only once per room.

**Excel Spreadsheet Note:** Space type LPD will be automatically propagated.

**Column (b) – Area.** Enter the area of the room in square feet. (Floor area is measured from the outside surface of exterior walls, and from the center of interior partition walls.) Enter the square footage only once per room. At the bottom of the Column (b) enter the sum of all the areas for this worksheet.

**Column (e) – Lighting Power Budget.** Multiply columns (b) x (d) to generate the room lighting power budget. Enter the budget only once per room. At the bottom of Column (e) enter the sum of all budgets for this worksheet. Note that as discussed previously, the budget does not need to be met on a room-by-room basis. Rather, the sum of the room budgets creates a tenant space or building budget.

**Excel Spreadsheet Note:** Budget will be automatically calculated.

**Column (c) – Space Type.** Enter the space type category for the room from Table 5a. (also Table 13H from the Building Code). Enter the space type only once per room. If a specific

# INTERIOR LIGHTING POWER

**Column (f) - Luminaire ID.** Enter the Luminaire ID from Worksheet 5a column (a).

**Column (g) - Quantity of Luminaires.** Enter the number of luminaires in the room. For track lighting, enter the lineal feet of track and do not include fixtures mounted on the track.

**Excel Spreadsheet Note:** Select the luminaire ID for column (f) from the pulldown menu.

**Excel Spreadsheet Note:** The value for column (h) will be automatically propagated based on the fixture selected in column (f).

**Column (h) - Luminaire Power.** Enter the luminaire power from Worksheet 5a column (e).

**Column (i) – Exempt Fixtures.** Check the box in column (e) if the luminaire is exempt from the budget.

Exempt lighting fixtures include the following provided that they are **in addition to general lighting and controlled by an independent control device:** (from Section 1313.1).

- 2.1 Production lighting for theatrical, television, spectator sports and like performance areas.
- 2.2 Decorative, special effect and production lighting for those portions of entertainment facilities such as theme parks, night clubs, discos and casinos where lighting is an essential technical element for the function performed.
- 2.3 Lighting equipment that is for sale.
- 2.4 Task lighting for medical and dental purposes.
- 2.5 Bench lighting for research laboratories.
- 2.6 Lighting to be used solely for indoor plant growth during the hours of 10 p.m. to 6 a.m.
- 2.7 Emergency lighting that is automatically off during normal building operation.
- 2.8 Art accent lighting required for art exhibits or displays in galleries, museums and monuments.
- 2.9 Sign lighting.
- 2.10 Nonpermanent lighting.

Exception 2.1 is specifically for production lighting used for the performance of productions,

such as theatrical spotlights highlighting a stage. This exception would not apply for production lighting used in a non-production task such as theatrical spotlights used in a retail environment.

Exception 2.4 is specifically for medical and dental task lighting. An example would be a light used by a dentist that shines into the mouth or the light in an X-ray viewing panel.

Exception 2.9 is specifically for lighting used only for signage and is controlled by an independent control device. This does not include perimeter-wall lighting.

Exception 2.10 is for lighting that is not part of the permanent building lighting systems. This would include plugged-in under shelf lighting in modular office furniture or plugged-in under shelf lighting in modular retail shelving. Lighting in cases, such as in grocery store upright freezers and within display cases, such as for jewelry are considered nonpermanent lighting. Examples of plug-in lighting that would be considered part of the building lighting system for inclusion in Lighting Power Allowance include metal halide fixtures and clamp-on (and plugged-in) theatrical-type lighting used in spaces that are not for theatrical purposes.

**Column (j) - Lighting Power.** Enter the product of column (g) and column (h). Include exempt fixtures and track lighting.

**Excel Spreadsheet Note:** The value for column (j) will be automatically calculated from column (g) and (h).

**Column (k) –Room Total Lighting Power.** Enter sum of lighting power for each luminaire within a specific room – sum of column (j) for that Room ID. **Include exempt fixtures and track lighting.** At the bottom of the Column (k) enter the total lighting power sums for all rooms on this worksheet. Do not include exempt fixtures and track lighting in this total.

**Excel Spreadsheet Note:** The value for column (k) will be automatically calculated from sum of column (j) for that Room ID. The total at the bottom of column (k) will not include exempt fixtures or track lighting.

# INTERIOR LIGHTING POWER

Total Number of Additional Worksheet 5b <input style="width: 50px;" type="text" value="0"/>			
Worksheet Number	(l) Lighting Power Budget: Space-by-Space only (Total of column (e))	(m) Proposed Building Lighting Power (Total of column (k), excluding exempt/track)	(n) Area Sqft. (not required for Tenant Method)
5b-1	1,063	1,338	1,025
5b-2			
5b-3			
Sum of additional 5b worksheets			
Total Budget (of all worksheets)	1,063	1,338	1,025

**Example**

**Column (l) – Lighting Power Budget Space-By-Space.** If using the Space-By-Space method, enter lighting power budget for all rooms for each worksheet from bottom of column (e). If more than 3 Worksheets 5b are needed, enter sum for all additional worksheets on the row “Sum of additional 5b Worksheets.” Sum the total of all worksheets in the last row of Column (j).

**Excel Spreadsheet Note:** The values for column (l) will be automatically inserted in Column (l).

**Column (m) – Building Total Lighting Power.** Enter the sum from the bottom of Column (k) from each Worksheet 5b in the appropriate row. If more than 3 Worksheets 5b are needed, enter the sum for all additional worksheets on the row “Sum of additional 5b Worksheets.” Sum the total of all worksheets in the last row of Column (j).

Enter this value in Line 9 of Form 5b (Tenant Space Method) or Line 8 of Form 5c (Space-by-Space Method).

**Excel Spreadsheet Note:** The values for column (m) will be automatically propagated and inserted on in Line 9 of Form 5b (Tenant Space Method) or Line 8 of Form 5c (Space-by-Space Method).

**Column (n) – Area Square Footage.** (for Space-By-Space Method only). Enter the sum from bottom of Column (b) from each Worksheet 5b in the appropriate row. If more than 3 Worksheets 5b are needed, enter the sum for all additional worksheets on the row “Sum of additional 5b Worksheets.” Sum the total of all worksheets in the last row of Column (j).

**Excel Spreadsheet Note:** The values for column (n) will be automatically calculated.

# INTERIOR LIGHTING POWER

## Worksheet 5c – Exterior Canopy and Parking Garage Lighting

Worksheet 5c is used for both the Tenant Space Method and Space-by-Space Method. Worksheet whenever an exterior canopy contains lighting fixtures or the building includes a parking garage.

Complete all of the information on Worksheet 5c and insert the appropriate result (Yes or No) on line 12 of Form 5b or 5c.

### Exterior Canopy Lighting

(a) Room ID (do not leave any blanks)	(b) Area (ft <sup>2</sup> )	(c) Canopy	(d) Space Type LPD	(e) Lighting Power Budget (b) x (d)	(f) Lum ID from Worksheet 5a Column (a)	(g) Quantity of Luminaires (or lineal ft. for track lighting)	(h) Luminaire Power (Watts)	(i) Exempt Fixtures	(j) Lighting Power (g) x (h)	(k) Room Total Ltg. Power	
Front	100	Canopies Under 15 feet in height	15	150	1a	12	10	<input type="checkbox"/>	120	120	
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
								<input type="checkbox"/>			
Total Exterior Canopy Budget				150	Total Exterior Canopy Lighting Power (excluding exempt fixtures)				120		

**Column (a) – Room ID.** Enter a short description for each illuminated canopy in column (a). In most instances, this will usually be a canopy description or other ID as specified on the plans. Do not leave any lines blank. If more than one luminaire type is in a canopy, that canopy will need multiple lines, so the same Room ID may be entered on several lines.

**Column (b) – Area.** Enter the area of canopy in square feet. (Canopy area is measured from the outside surface of canopy, and to the exterior surface of exterior walls.) Enter the square footage only once per canopy. At the bottom of the Column (b) enter the sum of all the areas for this worksheet.

**Column (c) – Canopy.** Enter the canopy type category from Table 5b. (also Table 13H from the Building Code). Enter the canopy type only once per room. Provide either “Canopies Under 15 feet in height” or “Canopies 15 feet and over in height.”

**Excel Spreadsheet Note:** Space type for column (c) can be chosen from a pull-down list (but only after room ID or area is entered).

**Column (d) – Space Type LPD.** Enter the space type lighting power density of 1.5 for Canopies Under 15 feet in height or 2.0 for Canopies 15 feet and over in height.

**Excel Spreadsheet Note:** Space type LPD will be automatically propagated.

**Column (e) – Lighting Power Budget.** Multiply columns (b) x (d) to generate the canopy lighting power budget. Enter the budget only once per room. At the bottom of Column (e) enter the sum of all budgets for this worksheet. Note that the budget does not need to be met on a canopy-by-canopy basis. Rather, the sum of the canopy budgets creates a canopy budget.

**Excel Spreadsheet Note:** Budget will be automatically calculated.

**Column (f) - Luminaire ID.** Enter the Luminaire ID from Worksheet 5a column (a).

**Excel Spreadsheet Note:** Select the luminaire ID for column (f) from the pull-down menu.

# INTERIOR LIGHTING POWER

**Column (g) - Quantity of Luminaires.** Enter the number of luminaires in the room. For track lighting, enter the lineal feet of track and do not include fixtures mounted on the track.

**Column (h) - Luminaire Power.** Enter the luminaire power from Worksheet 5a column (e).

**Excel Spreadsheet Note:** The value for column (h) will be automatically propagated based on the fixture selected in column (f).

**Column (i) – Exempt Fixtures.** Check the box in column (e) if the luminaire is exempt from the budget.

Exempt lighting fixtures include the following provided that they are **in addition to general lighting** and **controlled by an independent control device:** (from Section 1313.1).

- 2.1 Production lighting for theatrical, television, spectator sports and like performance areas.
- 2.2 Decorative, special effect and production lighting for those portions of entertainment facilities such as theme parks, night clubs, discos and casinos where lighting is an essential technical element for the function performed.
- 2.3 Lighting equipment that is for sale.
- 2.4 Task lighting for medical and dental purposes.
- 2.5 Bench lighting for research laboratories.
- 2.6 Lighting to be used solely for indoor plant growth during the hours of 10 p.m. to 6 a.m.
- 2.7 Emergency lighting that is automatically off during normal building operation.
- 2.8 Art accent lighting required for art exhibits or displays in galleries, museums and monuments.
- 2.9 Sign lighting.
- 2.10 Nonpermanent lighting.

Exception 2.1 is specifically for production lighting used for the performance of productions, such as theatrical spotlights highlighting a stage. This exception would not apply for production lighting used in a non-production task such as theatrical spotlights used in a retail environment.

Exception 2.4 is specifically for medical and dental task lighting. An example would be a light used by a dentist that shines into the mouth or the light in an X-ray viewing panel.

Exception 2.9 is specifically for lighting used only for signage and is controlled by an independent control device. This does not include perimeter-wall lighting.

Exception 2.10 is for lighting that is not part of the permanent building lighting systems. This would include plugged-in under shelf lighting in modular office furniture or plugged-in under shelf lighting in modular retail shelving. Lighting in cases, such as in grocery store upright freezers and within display cases, such as for jewelry are considered nonpermanent lighting. Examples of plug-in lighting that would be considered part of the building lighting system for inclusion in Lighting Power Allowance include metal halide fixtures and clamp-on (and plugged-in) theatrical-type lighting used in spaces that are not for theatrical purposes.

**Column (j) - Lighting Power.** Enter the product of column (g) and column (h). Include exempt fixtures and track lighting.

**Excel Spreadsheet Note:** The value for column (j) will be automatically calculated from column (g) and (h).

**Column (k) –Room Total Lighting Power.** Enter sum of lighting power for each luminaire within a specific canopy – sum of column (j) for that Room ID. **Include exempt fixtures and track lighting.** At the bottom of the Column (k) enter the total lighting power sums for all rooms on this worksheet. Do not include exempt fixtures and track lighting in this total.

**Excel Spreadsheet Note:** The value for column (k) will be automatically calculated from sum of column (j) for that Room ID. The total at the bottom of column (k) will not include exempt fixtures or track lighting.

<b>Does Canopy Lighting Power Comply?</b>	YES
---	-----

If the sum of column (k) is equal to or less than sum of column (e), insert “YES” or “NO” if sum of column (k) is greater than sum of column (e).

**Excel Spreadsheet Notes:** The values for sum of columns (e) and (k) will be automatically propagated.

# INTERIOR LIGHTING POWER

## Parking Garage Lighting

(a) Room ID (do not leave any blanks)	(b) Area (ft <sup>2</sup> )	(c) Parking Garage	(d) Space Type LPD	(e) Lighting Power Budget (b) x (d)	(f) Lum ID from Worksheet 5a Column (a)	(g) Quantity of Luminaires (or lineal ft. for track lighting)	(h) Luminaire Power (Watts)	(i) Exempt Fixtures	(j) Lighting Power (g) x (h)	(k) Room Total Ltg. Power
Garage	2500	Parking Garage – Garage Area	0.2	500	2a	8	62	<input type="checkbox"/>	496	496
								<input type="checkbox"/>		
								<input type="checkbox"/>		
								<input type="checkbox"/>		
								<input type="checkbox"/>		
								<input type="checkbox"/>		
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								<input type="checkbox"/>		
								<input type="checkbox"/>		
								<input type="checkbox"/>		
								<input type="checkbox"/>		
	2,500	Total Parking Garage Budget		500	Total Parking Garage Lighting Power (excluding exempt fixtures)				496	496

**Column (a) – Room ID.** Enter a short description for each parking garage in column (a). In most instances, this will usually be a parking garage description or other ID as specified on the plans. Do not leave any lines blank. If more than one luminaire type is in a parking garage, that parking garage will need multiple lines, so the same Room ID may be entered on several lines.

**Column (b) – Area.** Enter the area of parking garage in square feet. Enter the square footage only once per parking garage. At the bottom of the Column (b) enter the sum of all the areas for this worksheet.

**Column (c) – Space Type.** Enter “Parking Garage” in this cell.

**Excel Spreadsheet Note:** Space type for column (c) can be chosen from a pull-down list (but only after room ID or area is entered).

**Column (d) – Space Type LPD.** Enter the space type lighting power density of 0.2 for Parking Garage – Garage Area.

**Excel Spreadsheet Note:** Space type LPD will be automatically propagated.

**Column (e) – Lighting Power Budget.** Multiply columns (b) x (d) to generate the parking garage lighting power budget. Enter the budget only once per room/area. At the bottom of Column (e)

enter the sum of all budgets for this worksheet. Note that the budget does not need to be met on a garage-by-garage basis. Rather, the sum of the parking garage budgets creates a parking garage budget.

**Excel Spreadsheet Note:** Budget will be automatically calculated.

**Column (f) - Luminaire ID.** Enter the Luminaire ID from Worksheet 5a column (a).

**Excel Spreadsheet Note:** Select the luminaire ID for column (f) from the pull-down menu.

**Column (g) - Quantity of Luminaires.** Enter the number of luminaires in the room/area. For track lighting, enter the lineal feet of track and do not include fixtures mounted on the track.

**Column (h) - Luminaire Power.** Enter the luminaire power from Worksheet 5a column (e).

**Column (i) – Exempt Fixtures.** Check the box in column (e) if the luminaire is exempt from the budget.

Exempt lighting fixtures include the following provided that they are **in addition to general lighting and controlled by an independent control device:** (from Section 1313.1).

- 2.1 Production lighting for theatrical, television, spectator sports and like performance areas.



# INTERIOR LIGHTING POWER

2.2 Decorative, special effect and production lighting for those portions of entertainment facilities such as theme parks, night clubs, discos and casinos where lighting is an essential technical element for the function performed.

2.3 Lighting equipment that is for sale.

2.4 Task lighting for medical and dental purposes.

2.5 Bench lighting for research laboratories.

2.6 Lighting to be used solely for indoor plant growth during the hours of 10 p.m. to 6 a.m.

2.7 Emergency lighting that is automatically off during normal building operation.

2.8 Art accent lighting required for art exhibits or displays in galleries, museums and monuments.

2.9 Sign lighting.

2.10 Nonpermanent lighting.

Exception 2.1 is specifically for production lighting used for the performance of productions, such as theatrical spotlights highlighting a stage. This exception would not apply for production lighting used in a non-production task such as theatrical spotlights used in a retail environment.

Exception 2.4 is specifically for medical and dental task lighting. An example would be a light used by a dentist that shines into the mouth or the light in an X-ray viewing panel.

Exception 2.9 is specifically for lighting used only for signage and is controlled by an independent control device. This does not include perimeter-wall lighting.

Exception 2.10 is for lighting that is not part of the permanent building lighting systems. This would include plugged-in under shelf lighting in modular office furniture or plugged-in under shelf lighting in modular retail shelving. Lighting in cases, such as in grocery store upright freezers and within display cases, such as for jewelry are considered nonpermanent lighting. Examples of plug-in lighting that would be considered part of the building lighting system for inclusion in Lighting Power Allowance include metal halide fixtures and clamp-on (and plugged-in) theatrical-type lighting used in spaces that are not for theatrical purposes.

**Column (j) - Lighting Power.** Enter the product of column (g) and column (h). Include exempt fixtures and track lighting.

**Excel Spreadsheet Note:** The value for column (j) will be automatically calculated from column (g) and (h).

**Column (k) –Room Total Lighting Power.** Enter sum of lighting power for each luminaire within a specific parking garage – sum of column (j) for that Room ID. **Include exempt fixtures and track lighting.** At the bottom of the Column (k) enter the total lighting power sums for all rooms/areas on this worksheet. Do not include exempt fixtures and track lighting in this total.

**Excel Spreadsheet Note:** The value for column (k) will be automatically calculated from sum of column (j) for that Room ID. The total at the bottom of column (k) will not include exempt fixtures or track lighting.

<b>Does Parking Garage Lighting Power Comply?</b>	YES
---	-----

If the sum of column (k) is equal to or less than sum of column (e), insert “YES” or “NO” if sum of column (k) is greater than sum of column (e).

**Excel Spreadsheet Notes:** The values for sum of columns(e) and (k) will be automatically propagated.

# INTERIOR LIGHTING POWER

## Worksheet 5d - Retail Display Lighting

Worksheet 5d can only be used with the Space-by-Space Method. Worksheet 5d is used to identify all the luminaires that are specifically for retail display lighting. Retail display lighting used in this allowance must highlight retail merchandise and be switched (controlled) separately from the general retail sales lighting.

The area for this allowance is calculated on the footprint, floor area of the sales room where the display lighting is located. Do not use or include wall area or display area such as shelves, racks or vertical display areas. This display lighting

allowance is calculated for each retail space separately and cannot be traded with other retail spaces or utilized in other parts of the building. Each retail space or room must use a separate Worksheet 5d.

**Excel Spreadsheet Note:** Worksheet 5d will automatically propagate when "Space-by-Space Method" is selected on Line 7 of Form 5a

To automatically generate additional copies of Worksheet 5a, select the required number of additional worksheets from the pulldown box toward the bottom of the sheet.

<b>1. Room # or Space ID</b>	Retail Sales Floor
<b>2. Room Area (ft<sup>2</sup>)</b>	1500
<b>3. Retail Space Type</b>	Other Merchandise Sales Area

**Line 1 – Room # or Space ID.** Enter room number or a short description for each retail sales area where the retail display lighting is located within Line 1. In most instances, this will usually be the same description or other ID as specified on the plans

**Line 3 – Retail Space Type.** Enter one of the four specific Retail Space Types specified from Table 5b.

**Excel Spreadsheet Note:** Select the luminaire ID for Line 3 from the pulldown menu.

**Line 2 – Room Area (ft<sup>2</sup>).** Enter the square footage of the sales floor area's footprint. Do not include vertical surface areas or shelving area.

(a) Lum ID from Worksheet 5a Column (a)	(b) Quantity of Luminaires (or lineal ft. for track lighting)	(c) Luminaire Power (Watts)	(d) Lighting Power (b) x (c)
1a	10	27	270
T	40	50	2,000
		-	-
		-	-

**Column (a) - Luminaire ID.** Enter the Luminaire ID from Worksheet 5a column (a).

**Column (b) - Quantity of Luminaires.** Enter the number of luminaires in the room/area. For track lighting, enter the lineal feet of track and do not include fixtures mounted on the track.

**Excel Spreadsheet Note:** Select the luminaire ID for column (f) from the pulldown menu.

**Column (c) - Luminaire Power.** Enter the luminaire power from Worksheet 5a column (e).

## INTERIOR LIGHTING POWER

**Column (d) - Lighting Power.** Enter the product of column (b) and column (c). Include exempt fixtures and track lighting.

**Excel Spreadsheet Note:** The value for column (d) will be automatically calculated from column (b) and (c).

1.	Space Display Lighting Power (total d column excluding track fixtures)	270
2.	Total length of track lighting (ft)	40
3.	Line 2 multiplied by 50 Watts/ft	2000
4.	Total amperage of circuit breaker(s) serving track lighting (amps)	20
5.	Voltage of circuit breaker serving track lighting (volts)	120
6.	Maximum wattage of track lighting (multiply line 4 by line 5)	2400
7.	VA rating of the inline current limiter or the low voltage transformers	
8.	Track Lighting Power (the lesser value of line 3, 6 or 7)	2000

**Lines 1 through 8**

The code requires that lighting power used for track lighting be calculated as either 50 Watts per linear foot or the maximum circuit load of the over-current protection device (circuit breaker) serving track lighting (when track lighting is served by separate breakers), or inline current limiter or low voltage transformers whichever is less. See section 1313.2.3.

**Line 1 – Space Display Lighting Power.** Enter the total of column (d) above and do not include

**Excel Spreadsheet Note:** Track lighting that was entered in column (b) will automatically propagate.

any track lighting that was entered on this table.

**Line 2 – Total length of track.** Enter the total length of track lighting, in linear feet, from total that is track of column (b) above.

**Line 3.** Enter the product of line 2 multiplied by 50.

**Line 4.** Enter the total amperage of the circuit breakers serving the track lighting circuits.

**Line 5.** Enter the voltage circuit breakers serving the track lighting circuits.

**Line 6.** Enter the product of line 4 multiplied by line 5.

**Line 7.** If the track lighting system includes low voltage transformers or in-line current limiters, you may enter the sum of the listed VA rating values for the inline current limiters or low voltage transformers in line 6. Leave this cell blank if an inline current limiter or low voltage transformer is not used.

**Line 8.** Enter the lesser of the values from line 3 or line 6 or line 7.

**Excel Spreadsheet Notes:** Lines 2, 3, 6, and 8 will be calculated automatically.

# INTERIOR LIGHTING POWER

8.	Track Lighting Power (the lesser value of line 3, 6 or 7)	2000
9.	Total Space Display Lighting Power (Watts) (line 1 + line 8)	2270
10.	Total Space Display Lighting Power Budget (Watts) (room area x 1.75 to max of 17,500)	2625
11.	<b>Does Space Retail Display Meet Space Budget (Line 9 less than line 10 and less than 17,500 W)?</b>	<b>YES</b>

**Line 9.** Enter the sum of line 1 and line 8.

**Excel Spreadsheet Notes:** Lines 9, 10, and 11 will be calculated automatically.

**Line 10.** Enter the product of line 1 multiplied by 1.75 and **do not enter a value** that exceeds 17,500. If the product is greater than 17,500, enter 17,500.

**Excel Spreadsheet Notes:** If more than one Worksheet 5d is necessary, select the total number of sheets with the pulldown box at bottom of worksheet where provided for "Total Number of Additional Worksheet 5d".

**Line 11.** If line 9 is equal to or less than line 10, insert "YES" or "NO" if line 9 is greater than line 10.

## MAXIMUM POWER DENSITY

**TABLE 5a(13-G)  
TENANT SPACE METHOD  
MAXIMUM ALLOWABLE LIGHTING POWER DENSITY (LPD)<sup>1</sup>**

Tenant or Building Type <sup>1</sup>	Lighting Power Density (W/ft <sup>2</sup> )
Automotive Facility	0.9
Convention Center	1.2
Court House	1.2
Dining: Bar Lounge/Leisure	1.3
Dining: Cafeteria/Fast Food	1.4
Dining: Family	1.5
Exercise Center	1.0
Fire Station	0.8
Gymnasium	1.1
Healthcare – Clinic	1.0
Hospital	1.2
Hotel <sup>2</sup>	1.0
Library	1.3
Manufacturing Facility, Non-process Areas <sup>3</sup>	1.3
Motel <sup>2</sup>	1.0
Motion Picture Theatre	1.2
Multi-Family <sup>2</sup>	0.7
Museum	1.1
Office	1.0
Parking Garage	0.3
Performing Arts Theater	1.6
Police Station	1.0
Post Office	1.1
Religious Building	1.3
Retail	1.5
School/University	1.1
Service station canopies, including all types of vehicle fueling and service (except enclosed garages)	2.0
Sports Arena	1.1
Town Hall	1.0
Transportation	1.0
Warehouse	0.8
Workshop	1.4

For **SI**: 1 foot = 304.8 mm, 1 square foot = 0.929 m<sup>2</sup>.

<sup>1</sup> Attached canopies shall be included in the total building or tenant power allowance.

<sup>2</sup> Dwelling units and guestrooms are exempt from interior lighting power allowance requirements.

<sup>3</sup> Spaces used specifically for manufacturing process are exempt and shall not be included in the lighting power allowance calculations.

# MAXIMUM POWER DENSITY

**TABLE 5b (13-H)—SPACE-BY-SPACE METHOD  
MAXIMUM ALLOWABLE LIGHTING POWER DENSITY (LPD)**

<b>Common Space Types</b>	<b>LPD (W/ft<sup>2</sup>)</b>	<b>Building Specific Space Types (continued)</b>	<b>LPD (W/ft<sup>2</sup>)</b>
Office-enclosed	1.1	Gymnasium/Exercise Center	
Office-open plan	1.1	Playing Area	1.4
Conference/Meeting/Multipurpose	1.3	Exercise Area	0.9
Classroom/Lecture/Training	1.4	Fire Stations	
Lobby	1.3	Fire Station Engine Room	0.8
For Hotel	1.1	Sleeping Quarters	0.3
For Performing Arts Theater	3.3	Post Office-Sorting Area	1.2
For Motion Picture Theater	1.1	Convention Center – Exhibit Space	1.3
Audience/Seating Area	0.9	Library	
For Gymnasium	0.4	Card File & Cataloging	1.1
For Exercise Center	0.3	Stacks	1.7
For Convention Center	0.7	Reading Area	1.2
For Religious Buildings	1.7	Hospital	
For Sports Arenas	0.4	Emergency	2.7
For Performing Arts Theater	2.6	Recovery	0.8
For Motion Picture Theater	1.2	Nurse Station	1.0
For Transportation	0.5	Exam/Treatment	1.5
Atrium-first three floors	0.6	Pharmacy	1.2
Atrium-each additional floors	0.2	Patient Room	0.7
Lounge/Recreation	1.2	Operating Room	2.2
For Hospital	0.8	Nursery	0.6
Dining Area		Medical Supply	1.4
For Hotel/Motel	1.3	Physical Therapy	0.9
For Bar Lounge/Leisure Dining	1.4	Radiology	0.4
For Family Dining	2.1	Laundry-Washing	0.6
Food Preparation	1.2	Automotive – Service/Repair	0.7
Laboratory	1.4	Museum	
Restrooms	0.9	General Exhibition	1.0
Dressing/Locker/Fitting Room	0.6	Restoration	1.7
Corridor/Transition	0.5	Bank/Office – Banking Activity Area	1.5
For Hospital	1.0	Religious Buildings	
For Manufacturing Facility	0.5	Worship-pulpit, choir	2.4
Stairs-active	0.6	Fellowship Hall	0.9
Active Storage	0.8	Retail	
For Hospitals	0.9	Grocery Sales Area	2.0
Inactive Storage	0.3	Jewelry & Art Sales Area	3.5
For Museum	0.8	Other Merchandise Sales Area	2.0
Electrical/Mechanical	1.5	Mall Concourse	1.5
Workshop <sup>1</sup>	1.9	Sports Arena	
		Ring Sports Area	2.7
		Court Sports Area	2.3
		Indoor Plying Field Area	1.4
<b>Building Specific Space Types</b>		Warehouse	
Canopies		Fine Material Storage	1.4
Under 15 feet in height	1.5	Medium/Bulky Material Storage	0.9
15 feet and over in height	2.0	Parking Garage – Garage Area	0.2
Courthouse/Police Station		Transportation	
Courtroom	1.9	Airport - Concourse	0.6
Judges Chambers	1.3	Air/Train/Bus – Baggage Area	1.0
		Terminal – Ticket Counter	1.5

For SI: 1 foot = 304.8 mm, 1 square foot = 0.929 m<sup>2</sup>.

<sup>1</sup> Spaces used specifically for manufacturing are exempt.

# LUMINAIRE POWER

	Lamp		Ballast		Watts/	Comments
	No.	Designation	No.	Abbreviation	Description	
<b>Fluorescent Circline</b>	<b>Fluorescent Circline, Rapid Start (20W)</b>					
	1	FC6T9	1	MAG STD	Magnetic Standard	25 6" OD
	<b>Fluorescent Circline, Rapid Start (22 W)</b>					
	1	FC8T9	1	MAG STD	Magnetic Standard	27 8" OD
	<b>Fluorescent Circline, Rapid Start (32 W)</b>					
	1	FC12T9	1	MAG STD	Magnetic Standard	45 12" OD
	<b>Fluorescent Circline, Rapid Start (40 W)</b>					
	1	FC16T9	1	MAG STD	Magnetic Standard	57 16" OD
	<b>Fluorescent Circline, T5 Program Start (22 W)</b>					
	1	FC9T5	1	ELECT NO	Electronic Normal Light	28 8" OD
	2	FC9T5	1	ELECT NO	Electronic Normal Light	53 8" OD
	<b>Fluorescent Circline, T5 Program Start (40 W)</b>					
	1	FC12T5	1	ELECT NO	Electronic Normal Light	41 12" OD
	2	FC12T5	1	ELECT NO	Electronic Normal Light	80 12" OD
<b>Fluorescent Circline, T5 Rapid Start (55 W)</b>						
1	FC12T5HO	1	ELECT NO	Electronic Normal Light	55 12" OD	
2	FC12T5HO	1	ELECT NO	Electronic Normal Light	103 12" OD	
	1	FC12T5HO	1	ELECT DIM	Electronic Dimming	59 12" OD
<b>Fluorescent Circline, T5 Rapid Start (40 + 22 W)</b>						
1+1	FC12T5/FC9T5	1	ELECT NO	Electronic Normal Light	68 8" & 12" OD	
<b>Compact Fluorescent 2D</b>	<b>Compact Fluorescent 2D (10W, GR10q-4 Four Pin Base)</b>					
	1	CFS10W/GR10q	1	MAG STD	Magnetic Standard	16 3.6" across
	1	CFS10W/GR10q	1	ELECT	Electronic	13
	2	CFS10W/GR10q	1	ELECT	Electronic	26
	<b>Compact Fluorescent 2D (16W, GR10q-4 Four Pin Base)</b>					
	1	CFS16W/GR10q	1	MAG STD	Magnetic Standard	23 5.5" across
	1	CFS16W/GR10q	1	ELECT	Electronic	15
	2	CFS16W/GR10q	1	ELECT	Electronic	30
	<b>Compact Fluorescent 2D (21W, GR10q-4 Four Pin Base)</b>					
	1	CFS21W/GR10q	1	MAG STD	Magnetic Standard	31 5.5" across
	1	CFS21W/GR10q	1	ELECT	Electronic	21
	2	CFS21W/GR10q	1	ELECT	Electronic	42
	<b>Compact Fluorescent 2D (28W, GR10q-4 Four Pin Base)</b>					
	1	CFS28W/GR10q	1	MAG STD	Magnetic Standard	38 8.1" across
1	CFS28W/GR10q	1	ELECT	Electronic	28	
2	CFS28W/GR10q	1	ELECT	Electronic	56	
<b>Compact Fluorescent 2D (38W, GR10q-4 Four Pin Base)</b>						
1	CFS38W/GR10q	1	ELECT	Electronic	37 8.1" across	
2	CFS38W/GR10q	1	ELECT	Electronic	74	
<b>Compact Fluorescent Twin</b>	<b>Compact Fluorescent Twin (5 W, G23 Two Pin Base - F5TT Lamp)</b>					
	1	CFT5W/G23	1	MAG STD	Magnetic Standard	9 4.1" MOL
	2	CFT5W/G23	2	MAG STD	Magnetic Standard	18
	<b>Compact Fluorescent Twin (7 W, G23 Two Pin Base - F7TT Lamp)</b>					
	1	CFT7W/G23	1	MAG STD	Magnetic Standard	11 5.3" MOL
	2	CFT7W/G23	2	MAG STD	Magnetic Standard	22
	<b>Compact Fluorescent Twin (7 W, 2G7 Four Pin Base - F7TT Lamp)</b>					
	1	CFT7W/2G7	1	ELECT	Electronic	8 5.3" MOL
	2	CFT7W/2G7	2	ELECT	Electronic	16
	<b>Compact Fluorescent Twin (9 W, G23 Two Pin Base - F9TT Lamp)</b>					
1	CFT9W/G23	1	MAG STD	Magnetic Standard	13 6.5" MOL	
2	CFT9W/G23	2	MAG STD	Magnetic Standard	26	

# LUMINAIRE POWER

Lamp		Ballast			Watts/		
No.	Designation	No.	Abbreviation	Description	Luminaire	Comments	
<b>Compact Fluorescent Twin (9 W, 2G7 Four Pin Base - F9TT Lamp) (Cont.)</b>							
1	CFT9W/2G7	1	ELECT	Electronic	10	6.5" MOL	<b>Compact Fluorescent Twin (Cont.)</b>
2	CFT9W/2G7	2	ELECT	Electronic	20		
<b>Compact Fluorescent Twin (13 W, GX23 Two Pin Base - F13TT)</b>							
1	CFT13W/GX23	1	MAG STD	Magnetic Standard	17	7.5" MOL	
2	CFT13W/GX23	2	MAG STD	Magnetic Standard	34		
<b>Compact Fluorescent Twin (13 W, 2GX7 Four Pin Base - F13TT)</b>							
1	CFT13W/2GX7	1	ELECT	Electronic	17	7.5" MOL	
2	CFT13W/2GX7	2	ELECT	Electronic	34		
<b>Compact Fluorescent Quad (9 W, G23-2 Two Pin Base - F9DTT Lamp)</b>							
1	CFQ9W/G23-2	1	MAG STD 120	120 V Magnetic Standard	13	4.4" MOL	<b>Compact Fluorescent Quad</b>
2	CFQ9W/G23-2	2	MAG STD 120	120 V Magnetic Standard	26		
<b>Compact Fluorescent Quad (13 W, G24d-1 Two Pin Base - F13DTT Lamp)</b>							
1	CFQ13W/G24d-1	1	MAG STD 120	120 V Magnetic Standard	18	6.0" MOL	
2	CFQ13W/G24d-1	2	MAG STD 120	120 V Magnetic Standard	36		
1	CFQ13W/G24d-1	1	MAG STD 277	277 V Magnetic Standard	16		
2	CFQ13W/G24d-1	2	MAG STD 277	227 V Magnetic Standard	32		
<b>Compact Fluorescent Quad (13 W, GX23-2 Two Pin Base)</b>							
1	CFQ13W/GX23-2	1	MAG STD	Magnetic Standard	17	4.8" MOL	
2	CFQ13W/GX23-2	2	MAG STD	Magnetic Standard	34		
<b>Compact Fluorescent Quad (16W GX32d-1 Two Pin Base)</b>							
1	CFQ16W/GX32d-1	1	MAG STD	Magnetic Standard	20	5.5" MOL	
2	CFQ16W/GX32d-1	2	MAG STD	Magnetic Standard	40		
<b>Compact Fluorescent Quad (18 W, G24d-2 Two Pin Base - F18DTT Lamp)</b>							
1	CFQ18W/G24d-2	1	MAG STD 120	120 V Magnetic Standard	25	6.8" MOL	
2	CFQ18W/G24d-2	2	MAG STD 120	120 V Magnetic Standard	50		
1	CFQ18W/G24d-2	1	MAG STD 277	227 V Magnetic Standard	22		
2	CFQ18W/G24d-2	2	MAG STD 277	227 V Magnetic Standard	44		
<b>Compact Fluorescent Quad (22W, GX32d Two Pin Base)</b>							
1	CFQ22W/GX32d-2	1	MAG STD	Magnetic Standard	27	6.0" MOL	
2	CFQ22W/GX32d-2	2	MAG STD	Magnetic Standard	54		
<b>Compact Fluorescent Quad (26 W, G24d-3 Two Pin Base - F26DTT Lamp)</b>							
1	CFQ26W/G24d-3	1	MAG STD 120	120 V Magnetic Standard	37	7.6" MOL	
2	CFQ26W/G24d-3	2	MAG STD 120	120 V Magnetic Standard	74		
1	CFQ26W/G24d-3	1	MAG STD 277	227 V Magnetic Standard	33		
2	CFQ26W/G24d-3	2	MAG STD 277	227 V Magnetic Standard	66		
1	CFQ26W/G24d-3	1	ELECT 277V	277 V Electronic	27		
2	CFQ26W/G24d-3	2	ELECT 277V	277 V Electronic	54		
<b>Compact Fluorescent Quad (26W, G24q-3 Four Pin Base)</b>							
1	CFQ26W/G24q-3	1	ELECT	Electronic	26	7.6" MOL	
2	CFQ26W/G24q-3	2	ELECT	Electronic	52		
<b>Compact Fluorescent Quad (28W GX32d Two Pin Base)</b>							
1	CFQ28W/GX32d-3	1	MAG STD	Magnetic Standard	34	6.8" MOL	
2	CFQ28W/GX32d-3	2	MAG STD	Magnetic Standard	68		
<b>Compact Fluorescent Quad (10 W, G24q-1 Four Pin Base)</b>							
1	CFQ10W/G24q-1	1	MAG STD 120	120 V Magnetic Standard	16	4.6" MOL	
2	CFQ10W/G24q-1	2	MAG STD 120	120 V Magnetic Standard	32		
1	CFQ10W/G24q-1	1	MAG STD 277	227 V Magnetic Standard	13		
2	CFQ10W/G24q-1	2	MAG STD 277	227 V Magnetic Standard	26		
<b>Compact Fluorescent Quad (13 W, G24q-1 Four Pin Base)</b>							
1	CFQ13W/G24q-1	1	MAG STD 120	120 V Magnetic Standard	18	6.0" MOL	
2	CFQ13W/G24q-1	2	MAG STD 120	120 V Magnetic Standard	36		
1	CFQ13W/G24q-1	1	MAG STD 277	227 V Magnetic Standard	16		



## LUMINAIRE POWER

	Lamp		Ballast		Watts/	Comments	
	No.	Designation	No.	Abbreviation	Description		Luminaire
<b>Compact Fluorescent Quad (Cont.)</b>	<b>Compact Fluorescent Quad (13 W, G24q-1 Four Pin Base) (Cont.)</b>						
	2	CFQ13W/G24q-1	2	MAG STD 277	227 V Magnetic Standard	32	
	1	CFQ13W/G24q-1	1	ELECT	Electronic	14	
	2	CFQ13W/G24q-1	2	ELECT	Electronic	25	
	<b>Compact Fluorescent Quad (13 W, GX7 Four Pin Base)</b>						
	1	CFQ13W/GX7	1	MAG STD	Magnetic Standard	17	4.8" MOL
	2	CFQ13W/GX7	2	MAG STD	Magnetic Standard	34	
	<b>Compact Fluorescent Quad (18 W, G24q-2 Four Pin Base)</b>						
	1	CFQ18W/G24q-2	1	MAG STD 120	120 V Magnetic Standard	25	6.8" MOL
	2	CFQ18W/G24q-2	2	MAG STD 120	120 V Magnetic Standard	50	
	1	CFQ18W/G24q-2	1	MAG STD 277	227 V Magnetic Standard	22	
	2	CFQ18W/G24q-2	2	MAG STD 277	227 V Magnetic Standard	44	
	1	CFQ18W/G24q-2	1	ELECT	Electronic	21	
	2	CFQ18W/G24q-2	2	ELECT	Electronic	38	
	3	CFQ18W/G24q-2	1	ELECT	Electronic	50	
<b>Compact Fluorescent Triple</b>	<b>Compact Fluorescent Triple (13 W, GX24q-1 Four Pin Base)</b>						
	1	CFM 13W/GX24q-1	1	MAG STD	Magnetic Standard	18	4.2" MOL
	2	CFM 13W/GX24q-1	2	MAG STD	Magnetic Standard	36	
	<b>Compact Fluorescent Triple (13 W, GX24q-1 Four Pin Base)</b>						
	1	CFM 13W/GX24q-1	1	ELECT	Electronic	14	
	2	CFM 13W/GX24q-1	2	ELECT	Electronic	25	
	<b>Compact Fluorescent Triple (18W, GX24q-2 Four Pin Base)</b>						
	1	CFM 18W/GX24q-2	1	MAG STD	Magnetic Standard	25	5.0" MOL
	2	CFM 18W/GX24q-2	2	MAG STD	Magnetic Standard	50	
	1	CFM 18W/GX24q-2	1	ELECT	Electronic	21	
	2	CFM 18W/GX24q-2	2	ELECT	Electronic	38	
	<b>Compact Fluorescent Triple (26W, GX24q-3 Four Pin Base)</b>						
	1	CFTR26W/GX24q-3	1	MAG STD	Magnetic Standard	37	4.9 to 5.4" MOL
	2	CFTR26W/GX24q-3	2	MAG STD	Magnetic Standard	74	
	1	CFTR26W/GX24q-3	1	ELECT	Electronic	28	
2	CFTR26W/GX24q-3	1	ELECT	Electronic	55		
1	CFTR26W/GX24q-3	1	ELECT DIM	Electronic Dimming	29		
2	CFTR26W/GX24q-3	1	ELECT DIM	Electronic Dimming	57		
<b>Compact Fluorescent Triple (32 W, GX24q-3 Four Pin Base)</b>							
1	CFTR32WGX24q-3	1	ELECT	Electronic	35		
2	CFTR32WGX24q-3	1	ELECT	Electronic	69		
1	CFTR32WGX24q-3	1	ELECT DIM	Electronic Dimming	38	BF~1.05	
2	CFTR32WGX24q-3	1	ELECT DIM	Electronic Dimming	76	BF~1.05	
<b>Compact Fluorescent Triple or Quad (42W, GX24q-4 Four Pin Base)</b>							
1	CFTR42WGX24q-4	1	ELECT	Electronic	46		
2	CFTR42WGX24q-4	1	ELECT	Electronic	94		
1	CFTR42WGX24q-4	1	ELECT DIM	Electronic Dimming	49	BF~1.05	
2	CFTR42WGX24q-4	1	ELECT DIM	Electronic Dimming	98	BF~1.05	
<b>Compact Fluorescent Triple or Quad (57W, GX24q-5 Four Pin Base)</b>							
1	CFTR57WGX24q-5	1	ELECT	Electronic	62		
1	CFTR57WGX24q-5	1	ELECT DIM	Electronic Dimming	66	BF~1.05	
<b>Compact Fluorescent Triple or Quad (70W, GX24q-6 Four Pin Base)</b>							
1	CFTR70WGX24q-6	1	ELECT	Electronic	75		
1	CFTR70WGX24q-6	1	ELECT DIM	Electronic Dimming	80	BF~1.00	
1	CFTR70WGX24q-6	1	ELECT	Electronic	75		
1	CFTR70WGX24q-6	1	ELECT DIM	Electronic Dimming	80	BF~1.00	

# LUMINAIRE POWER

Lamp		Ballast			Watts/		Comments	
No.	Designation	No.	Abbreviation	Description	Luminaire			
<b>Fluorescent T5 Twin (18W - F18TT Lamp)</b>								
1	FT18W/2G11	1	MAGNETIC	Magnetic Energy Efficient	23	BF~1.0	<b>Fluorescent Twin</b>	
2	FT18W/2G11	1	MAGNETIC	Magnetic Energy Efficient	46	BF~1.0		
3	FT18W/2G11	1	MAGNETIC	Magnetic Energy Efficient	69			
3	FT18W/2G11	2	MAGNETIC	Magnetic Energy Efficient	69			
4	FT18W/2G11	2	MAGNETIC	Magnetic Energy Efficient	92	2-lamp ballasts		
1	FT18W/2G11	1	ELECT	Electronic	24			
2	FT18W/2G11	1	ELECT	Electronic	35			
3	FT18W/2G11	1	ELECT	Electronic	52			
3	FT18W/2G11	2	ELECT	Electronic	52			
4	FT18W/2G11	2	ELECT	Electronic	70	2-lamp ballasts		
<b>Fluorescent T5 Twin (24-27W- F24TT or F27TT Lamp)</b>								
1	FT24W/2G11	1	MAGNETIC	Magnetic Energy Efficient	32			
2	FT24W/2G11	1	MAGNETIC	Magnetic Energy Efficient	66			
3	FT24W/2G11	1.5	MAGNETIC	Magnetic Energy Efficient	99	Tandem Wired		
3	FT24W/2G11	2	MAGNETIC	Magnetic Energy Efficient	98			
4	FT24W/2G11	2	MAGNETIC	Magnetic Energy Efficient	132	2-lamp Ballasts		
1	FT24W/2G11	1	ELECT	Electronic	27	BF~1.0		
2	FT24W/2G11	1	ELECT	Electronic	52	BF~1.0		
3	FT24W/2G11	1.5	ELECT	Electronic	64	Tandem Wired		
3	FT24W/2G11	2	ELECT	Electronic	64			
4	FT24W/2G11	2	ELECT	Electronic	88	2-lamp ballasts		
<b>Fluorescent T5 Twin (36-39W - F36TT or F39TT Lamp)</b>								
1	FT36W/2G11	1	MAG EE	Magnetic Energy Efficient	51			
2	FT36W/2G11	1	MAG EE	Magnetic Energy Efficient	66			
3	FT36W/2G11	2	MAG EE	Magnetic Energy Efficient	117			
4	FT36W/2G11	2	MAG EE	Magnetic Energy Efficient	132			
1	FT36W/2G11	1	ELECT	Electronic	37			
2	FT36W/2G11	1	ELECT	Electronic	70			
3	FT36W/2G11	1.5	ELECT	Electronic	105			
<b>Fluorescent T5 Twin (36-39W - F36TT or F39TT Lamp) (Cont.)</b>								
3	FT36W/2G11	2	ELECT	Electronic	107			
4	FT36W/2G11	2	ELECT	Electronic	140			
1	FT36W/2G11	1	ELEC THO	Electronic High Output	46	BF~1.22		
2	FT36W/2G11	1	ELEC THO	Electronic High Output	86	BF~1.20		
<b>Fluorescent T5 Twin (40 W - F40TT Lamp)</b>								
1	FT40W/2G11	1	MAG EE	Magnetic Energy Efficient	43			
2	FT40W/2G11	1	MAG EE	Magnetic Energy Efficient	86			
3	FT40W/2G11	1.5	MAG EE	Magnetic Energy Efficient	129			
3	FT40W/2G11	2	MAG EE	Magnetic Energy Efficient	130			
4	FT40W/2G11	2	MAG EE	Magnetic Energy Efficient	172			
1	FT40W/2G11	1	ELECT NO*	Electronic	41	BF~.90		
2	FT40W/2G11	1	ELECT NO*	Electronic	78	BF~.97		
3	FT40W/2G11	1	ELECT NO*	Electronic	103	BF~.86		
1	FT40W/2G11	1	ELECT HO*	Electronic High Output	50	BF~1.1		
1	FT40W/2G11	1	ELECT DIM	Electronic Dimming	41	BF~1.0		
2	FT40W/2G11	1	ELECT DIM	Electronic Dimming	80	BF~1.0		
3	FT40W/2G11	2	ELECT	Electronic	107			
4	FT40W/2G11	2	ELECT	Electronic	142			

\* Key for ballast factor (BF). RO=Reduced Output – BF=.70 to .85 NO=Normal Output – BF=.85 to 1.0  
HO=High Output – BF=>1.0

# LUMINAIRE POWER

	Lamp		Ballast			Watts/	Comments
	No.	Designation	No.	Abbreviation	Description	Luminaire	
<b>Fluorescent Twin (Cont.)</b>	<b>Fluorescent T5 Twin (50 W - F50TT Lamp)</b>						
	1	FT50W/2G11	1	ELECT NO*	Electronic Normal Output	54	BF~.98
	2	FT50W/2G11	1	ELECT NO*	Electronic Normal Output	106	BF~.98
	3	FT50W/2G11	1	ELECT NO*	Electronic Normal output	98	BF~.98
	3	FT50W/2G11	2	ELECT	Electronic	160	
	4	FT50W/2G11	2	ELECT	Electronic	212	
	1	FT50W/2G11	1	ELECT HO*	Electronic High Output	61	BF~1.12
	2	FT50W/2G11	1	ELECT HO*	Electronic High Output	115	BF~1.10
	1	FT50W/2G11	1	ELECT DIM	Electronic Dimming	51	
	2	FT50W/2G11	1	ELECT DIM	Electronic Dimming	92	
	<b>Fluorescent T5 Twin (55 W - F55TT Lamp)</b>						
	1	FT55W/2G11	1	ELECT NO*	Electronic Normal Output	58	BF~.92
	2	FT55W/2G11	1	ELECT NO*	Electronic Normal Output	109	BF~.90
	1	FT55W/2G11	1	ELECT DIM	Electronic Dimming	59	BF~.90
2	FT55W/2G11	1	ELECT DIM	Electronic Dimming	114	BF~.90	
<b>Fluorescent T5 Twin (80 W - F80TT Lamp)</b>							
1	FT80W/2G11	1	ELECT NO	Electronic	91	BF~1.00	
<b>Fluorescent U-Tube</b>	<b>2 ft. Fluorescent U-Tube T8 (32W - FBO31T8 or F32T8/U/6 Lamp)</b>						
	1	FB31T8/F32T8U	0.5	MAGNETIC	Magnetic Energy Efficient	35	Tandem wired
	1	FB31T8/F32T8U	1	MAGNETIC	Magnetic Energy Efficient	36	
	2	FB31T8/F32T8U	1	MAGNETIC	Magnetic Energy Efficient	69	
	3	FB31T8/F32T8U	1.5	MAGNETIC	Magnetic Energy Efficient	104	Tandem wired
	3	FB31T8/F32T8U	2	MAGNETIC	Magnetic Energy Efficient	105	
	1	FB31T8/F32T8U	1	ELECT NO*	Electronic Normal Output	39	
	2	FB31T8/F32T8U	1	ELECT NO*	Electronic Normal Output	62	
	3	FB31T8/F32T8U	1	ELECT NO*	Electronic Normal Output	92	
	4	FB31T8/F32T8U	1	ELECT NO*	Electronic Normal Output		
	1	FB31T8/F32T8U	1	ELECT DIM	Electronic Dimming	33	BF~.88
	2	FB31T8/F32T8U	1	ELECT DIM	Electronic Dimming	64	BF~.88
	3	FB31T8/F32T8U	1	ELECT DIM	Electronic Dimming	93	BF~.88
	4	FB31T8/F32T8U	1	ELECT DIM	Electronic Dimming	116	BF~.88
	2	FB31T8/F32T8U	1	ELECT IS	Electronic Instant Start	61	
	3	FB31T8/F32T8U	1	ELECT IS	Electronic Instant Start	88	
	<b>2 ft. Fluorescent U-Tube T12 ("Energy Saving" 34W)</b>						
	1	FB40T12/ES	0.5	MAGNETIC	Magnetic Energy Efficient	36	Tandem wired
	1	FB40T12/ES	1	MAGNETIC	Magnetic Energy Efficient	43	
	2	FB40T12/ES	1	MAGNETIC	Magnetic Energy Efficient	72	
	3	FB40T12/ES	1	MAGNETIC	Magnetic Energy Efficient	105	
	3	FB40T12/ES	1.5	MAGNETIC	Magnetic Energy Efficient	108	Tandem wired
	3	FB40T12/ES	2	MAGNETIC	Magnetic Energy Efficient	115	
	1	FB40T12/ES	0.5	ELECT	Electronic	30	Tandem wired
	1	FB40T12/ES	1	ELECT	Electronic	31	
	2	FB40T12/ES	1	ELECT	Electronic	59	
	3	FB40T12/ES	1	ELECT	Electronic	90	
3	FB40T12/ES	1.5	ELECT	Electronic	88	Tandem wired	
3	FB40T12/ES	2	ELECT	Electronic	90		
<b>2 ft. Fluorescent U-Tube T-12 ("Standard" 40W)</b>							
1	FB40T12	0.5	MAGNETIC	Magnetic Energy Efficient	43	Tandem wired	
1	FB40T12	1	MAGNETIC	Magnetic Energy Efficient	48		

\* Key for ballast factor (BF). RO=Reduced Output – BF=.70 to .85 NO=Normal Output – BF=.85 to 1.0  
HO=High Output – BF=>1.0

# LUMINAIRE POWER

Lamp		Ballast			Watts/	
No.	Designation	No.	Abbreviation	Description	Luminaire	Comments
<b>2 ft. Fluorescent U-Tube T-12 ("Standard" 40W) (Cont.)</b>						
2	FB40T12	1	MAGNETIC	Magnetic Energy Efficient	86	
3	FB40T12	1	MAGNETIC	Magnetic Energy Efficient	127	
3	FB40T12	1.5	MAGNETIC	Magnetic Energy Efficient	129	Tandem wired
3	FB40T12	2	MAGNETIC	Magnetic Energy Efficient	134	
1	FB40T12	0.5	ELECT	Electronic	35	Tandem wired
1	FB40T12	1	ELECT	Electronic	36	
2	FB40T12	1	ELECT	Electronic	67	
3	FB40T12	1	ELECT	Electronic	100	
3	FB40T12	1.5	ELECT	Electronic	101	Tandem wired
3	FB40T12	2	ELECT	Electronic	103	
<b>Fluorescent Preheat T5 (4W)</b>						
1	F4T5	1	MAG STD	Magnetic Standard	8	6" MOL
<b>Fluorescent Preheat T5 (6W)</b>						
1	F6T5	1	MAG STD	Magnetic Standard	10	9" MOL
<b>Fluorescent Preheat T5 (8W)</b>						
1	F8T5	1	MAG STD	Magnetic Standard	12	12" MOL
<b>Fluorescent Preheat T8 (15W)</b>						
1	F15T8	1	MAG STD	Magnetic Standard	19	18" MOL
<b>Fluorescent Preheat T12 (15W)</b>						
1	F15T12	1	MAG STD	Magnetic Standard	19	18" MOL
<b>Fluorescent Preheat T12 (20W)</b>						
1	F20T12	1	MAG STD	Magnetic Standard	25	24" MOL
2	F20T12	1	MAG STD	Magnetic Standard	50	24" MOL
<b>Fluorescent Preheat T8 (30W)</b>						
1	F30T8	1	MAG STD	Magnetic Standard	46	30" MOL
2	F30T8	1	MAG STD	Magnetic Standard	79	30" MOL
<b>Fluorescent Preheat T12 (30W)</b>						
1	F30T12	1	MAG STD	Magnetic Standard	46	30" MOL
2	F30T12	1	MAG STD	Magnetic Standard	79	30" MOL
2	F30T12	1	MAGNETIC	Magnetic Energy Efficient	74	30" MOL
1	F30T12	1	ELECT	Electronic	31	30" MOL
2	F30T12	2	ELECT	Electronic	63	30" MOL
<b>~23" Fluorescent Program Start T5 (14W)</b>						
1	F14T5	1	ELECT	Elect. Program Start	18	BF~1.0
2	F14T5	1	ELECT	Elect. Program Start	34	BF~1.0
<b>~34.5" Fluorescent Program Start T5 (21W)</b>						
1	F21T5	1	ELECT	Elect. Program Start	27	BF~1.0
2	F21T5	1	ELECT	Elect. Program Start	50	BF~1.0
<b>~46" Fluorescent Program Start T5 (28W)</b>						
1	F28T5	1	ELECT	Elect. Program Start	30	BF~1.0
2	F28T5	1	ELECT	Elect. Program Start	60	BF~1.0
<b>~58.5" Fluorescent Program Start T5 (35W)</b>						
1	F35T5	1	ELECT	Elect. Program Start	40	BF~1.0
2	F35T5	1	ELECT	Elect. Program Start	78	BF~1.0
<b>~23" Fluorescent Program Start T5 High Output (24W)</b>						
1	F24T5HO	1	ELECT	Elect. Program Start	27	BF~1.0
2	F24T5HO	1	ELECT	Elect. Program Start	52	BF~1.0
<b>~34.5" Fluorescent Program Start T5 High Output(39W)</b>						
1	F39T5	1	ELECT	Elect. Program Start	43	BF~1.0
2	F39T5	1	ELECT	Elect. Program Start	85	BF~1.0

**Fluorescent  
U-Tube  
(Cont.)**

**Fluorescent  
Linear  
Lamps -  
Preheat**

**Fluorescent  
Linear  
Lamps - T5**

**LUMINAIRE POWER**

	Lamp		Ballast			Watts/	Comments	
	No.	Designation	No.	Abbreviation	Description	Luminaire		
<b>Fluorescent Linear Lamps – T5 (Cont.)</b>	<b>~46" Fluorescent Program Start T5 High Output (54W)</b>							
	1	F54T5	1	ELECT	Elect. Program Start	62	BF~1.0	
	2	F54T5	1	ELECT	Elect. Program Start	117	BF~1.0	
	3	F54T5	2	ELECT	Elect. Program Start	176	BF~1.0	
	4	F54T5	2	ELECT	Elect. Program Start	234	BF~1.0	
<b>Fluorescent Rapid Start</b>	<b>~57.5" Fluorescent Program Start T5 High Output (80W)</b>							
	1	F80T5	1	ELECT	Elect. Program Start	89	BF~1	
<b>Fluorescent Rapid Start</b>	<b>2 foot Fluorescent Rapid Start T8 (17W)</b>							
	1	F17T8	1	MAGNETIC	Magnetic Energy Efficient	24		
	2	F17T8	1	MAGNETIC	Magnetic Energy Efficient	45		
	1	F17T8	1	ELECT NO*	Electronic Normal Output	22		
	2	F17T8	1	ELECT NO*	Electronic Normal Output	33		
	3	F17T8	1	ELECT NO*	Electronic Normal Output	53		
	3	F17T8	2	ELECT NO*	Electronic Normal Output	55		
	4	F17T8	1	ELECT NO*	Electronic Normal Output	63		
<b>Fluorescent Rapid Start</b>	<b>2 foot Fluorescent Rapid Start T8 (17W)</b>							
	1	F17T8	1	ELECT DIM	Electronic Dimming	20	BF~.88	
	2	F17T8	1	ELECT DIM	Electronic Dimming	37	BF~.88	
	3	F17T8	1	ELECT DIM	Electronic Dimming	56	BF~.88	
	4	F17T8	1	ELECT DIM	Electronic Dimming	69	BF~.88	
<b>Fluorescent Rapid Start</b>	<b>3 foot Fluorescent Rapid Start T8 (25W)</b>							
	1	F25T8	1	MAGNETIC	Magnetic Energy Efficient	33		
	2	F25T8	1	MAGNETIC	Magnetic Energy Efficient	65		
	1	F25T8	1	ELECT NO*	Electronic Normal Output	27		
	2	F25T8	1	ELECT NO*	Electronic Normal Output	48		
	3	F25T8	1	ELECT NO*	Electronic Normal Output	68		
	4	F25T8	1	ELECT NO*	Electronic Normal Output	89		
	1	F25T8	1	ELECT RO*	Electronic Reduced Output	24	BF~.82	
	2	F25T8	1	ELECT RO*	Electronic Reduced Output	41	BF~.78	
	3	F25T8	1	ELECT RO*	Electronic Reduced Output	59	BF~.77	
	4	F25T8	1	ELECT RO*	Electronic Reduced Output	77	BF~.76	
	1	F25T8	1	ELECT HO*	Electronic High Output	29	BF~1.05	
	2	F25T8	1	ELECT HO*	Electronic High Output	51	BF~1.05	
	3	F25T8	1	ELECT HO*	Electronic High Output	74	BF~1.05	
	1	F25T8	1	ELECT DIM	Electronic Dimming	25	BF~.94	
	2	F25T8	1	ELECT DIM	Electronic Dimming	49	BF~.94	
	3	F25T8	1	ELECT DIM	Electronic Dimming	76	BF~.94	
	4	F25T8	1	ELECT DIM	Electronic Dimming	89	BF~.95	
	<b>Fluorescent Instant Start T8</b>	<b>3 foot Fluorescent Rapid Start T12 ("Energy Saving" 25W)</b>						
		1	F25T12ES	1	ELECT NO*	Electronic Normal Output	27	
2		F25T12ES	1	ELECT NO*	Electronic Normal Output	52		
3		F25T12ES	1	ELECT NO*	Electronic Normal Output	77		
	4	F25T12ES	1	ELECT NO*	Electronic Normal Output	95		
<b>Fluorescent Instant Start T8</b>	<b>4 foot Fluorescent Instant Start T8 ("Energy Saving" 30W)</b>							
	1	F32T8/30ES	1	ELECT NO*	Electronic Normal Output	29		
	2	F32T8/30ES	1	ELECT NO*	Electronic Normal Output	54		

\* Key for ballast factor (BF). RO=Reduced Output – BF=.70 to .85 NO=Normal Output – BF=.85 to 1.0  
HO=High Output – BF=>1.0

# LUMINAIRE POWER

Lamp		Ballast			Watts/	
No.	Designation	No.	Abbreviation	Description	Luminaire	Comments
<b>4 foot Fluorescent Instant Start T8 ("Energy Saving" 30W) (Cont.)</b>						
3	F32T8/30ES	1	ELECT NO*	Electronic Normal Output	79	
4	F32T8/30ES	1	ELECT NO*	Electronic Normal Output	104	
1	F32T8/30ES	1	ELECT RO*	Electronic Reduced Output	27	BF~.75
2	F32T8/30ES	1	ELECT RO*	Electronic Reduced Output	48	BF~.75
3	F32T8/30ES	1	ELECT RO*	Electronic Reduced Output	70	BF~.75
4	F32T8/30ES	1	ELECT RO*	Electronic Reduced Output	91	BF~.75
1	F32T8/30ES	1	ELECT NO* EE	EE Normal Output	33	
2	F32T8/30ES	1	ELECT NO* EE	EE Normal Output	52	
<b>4 foot Fluorescent Instant Start T8 ("Energy Saving" 30W) (Cont.)</b>						
3	F32T8/30ES	1	ELECT NO* EE	EE Normal Output	77	
4	F32T8/30ES	1	ELECT NO* EE	EE Normal Output	101	
1	F32T8/30ES	1	ELECT RO* EE	EE Reduced Output	28	BF~.78
2	F32T8/30ES	1	ELECT RO* EE	EE Reduced Output	45	BF~.78
3	F32T8/30ES	1	ELECT RO* EE	EE Reduced Output	66	BF~.78
4	F32T8/30ES	1	ELECT RO* EE	EE Reduced Output	88	BF~.78
<b>4 foot Fluorescent Rapid Start T8 (32W)</b>						
1	F32T8	0.5	MAGNETIC	Magnetic Energy Efficient	35	Tandem wired
1	F32T8	1	MAGNETIC	Magnetic Energy Efficient	39	
2	F32T8	1	MAGNETIC	Magnetic Energy Efficient	70	
3	F32T8	1.5	MAGNETIC	Magnetic Energy Efficient	105	Tandem wired
3	F32T8	2	MAGNETIC	Magnetic Energy Efficient	109	
4	F32T8	2	MAGNETIC	Magnetic Energy Efficient	140	(2) two-lamp
<b>4 foot Fluorescent Rapid Start T8 (32W)</b>						
1	F32T8	0.5	ELECT NO*	Electronic Normal Output	31	
1	F32T8	1	ELECT NO*	Electronic Normal Output	32	
2	F32T8	1	ELECT NO*	Electronic Normal Output	62	
3	F32T8	1	ELECT NO*	Electronic Normal Output	93	
3	F32T8	1.5	ELECT NO*	Electronic Normal Output	93	Tandem wired
4	F32T8	1	ELECT NO*	Electronic Normal Output	114	
1	F32T8	1	EE NO*	EE Normal Output	35	
2	F32T8	1	EE NO*	EE Normal Output	55	
3	F32T8	1	EE NO*	EE Normal Output	82	
4	F32T8	1	EE NO*	EE Normal Output	107	
1	F32T8	1	ELECT RO*	Electronic Reduced Output	29	BF~.75
2	F32T8	1	ELECT RO*	Electronic Reduced Output	51	BF~.75
3	F32T8	1	ELECT RO*	Electronic Reduced Output	76	BF~.75
4	F32T8	1	ELECT RO*	Electronic Reduced Output	100	BF~.75
2	F32T8	1	ELECT HO*	Electronic High Output	77	BF~1.13
3	F32T8	1	ELECT HO*	Electronic High Output	112	BF~1.18
1	F32T8	1	EE RO*	EE Reduced Output	30	BF~.74
2	F32T8	1	EE RO*	EE Reduced Output	48	BF~.74

**Fluorescent  
Instant  
Start T8  
(Cont.)**

\* Key for ballast factor (BF). RO=Reduced Output – BF=.70 to .85 NO=Normal Output – BF=.85 to 1.0  
HO=High Output – BF=>1.0

# LUMINAIRE POWER

	Lamp		Ballast			Watts/	Comments	
	No.	Designation	No.	Abbreviation	Description	Luminaire		
<b>Fluorescent Rapid Start T8 (Cont.)</b>	<b>4 foot Fluorescent Rapid Start T8 (32W) (Cont.)</b>							
	3	F32T8	1	EE RO*	EE Reduced Output	73	BF~.74	
	4	F32T8	1	EE RO*	EE Reduced Output	96	BF~.74	
	2	F32T8	1	ELECT TL	Electronic Two Level (50 & 100%)	65		
	3	F32T8	1.5	ELECT TL	Electronic Two Level (50 & 100%)	98	Tandem wired	
	4	F32T8	2	ELECT TL	Electronic Two Level (50 & 100%)	130	2-lamp ballasts	
	1	F32T8	1	ELECT DIM	Electronic Dimming	35	BF~1.0	
	2	F32T8	1	ELECT DIM	Electronic Dimming	68	BF~1.0	
	3	F32T8	1	ELECT DIM	Electronic Dimming	102	BF~1.0	
	4	F32T8	1	ELECT DIM	Electronic Dimming	116	BF~.88	
	1	F40T8	1	MAGNETIC	Magnetic Energy Efficient	50		
	2	F40T8	1	MAGNETIC	Magnetic Energy Efficient	92		
	1	F40T8	1	ELECT	Electronic	46		
	2	F40T8	1	ELECT	Electronic	79		
	3	F40T8	1	ELECT	Electronic	112		
	<b>Fluorescent Rapid Start T12</b>	<b>3 foot Fluorescent Rapid Start T12 ("Energy-Saving" 25W)</b>						
		1	F30T12/ES	1	MAG STD	Magnetic Standard	42	
2		F30T12/ES	1	MAG STD	Magnetic Standard	74		
3		F30T12/ES	1.5	MAG STD	Magnetic Standard	111	Tandem wired	
3		F30T12/ES	2	MAG STD	Magnetic Standard	116		
2		F30T12/ES	1	MAGNETIC	Magnetic Energy Efficient	66		
1		F30T12/ES	1	ELECT	Electronic	26		
2		F30T12/ES	1	ELECT	Electronic	53		
<b>3 foot Fluorescent Rapid Start T12 ("Standard" 30W)</b>								
1		F30T12	1	MAG STD	Magnetic Standard	46		
2		F30T12	1	MAG STD	Magnetic Standard	79		
3		F30T12	1.5	MAG STD	Magnetic Standard	118	Tandem wired	
3		F30T12	2	MAG STD	Magnetic Standard	125		
2		F30T12	1	MAGNETIC	Magnetic Energy Efficient	73		
1		F30T12	1	ELECT	Electronic	30		
2		F30T12	1	ELECT	Electronic	60		
<b>4 foot Fluorescent Rapid Start T12 ("Energy-Saving Plus" 32W)</b>								
1	F40T12/ES Plus	0.5	MAGNETIC	Magnetic Energy Efficient	34	Tandem wired		
1	F40T12/ES Plus	1	MAGNETIC	Magnetic Energy Efficient	41			
2	F40T12/ES Plus	1	MAGNETIC	Magnetic Energy Efficient	68			
3	F40T12/ES Plus	1	MAGNETIC	Magnetic Energy Efficient	99			
3	F40T12/ES Plus	1.5	MAGNETIC	Magnetic Energy Efficient	102	Tandem wired		
3	F40T12/ES Plus	2	MAGNETIC	Magnetic Energy Efficient	109			
4	F40T12/ES Plus	2	MAGNETIC	Magnetic Energy Efficient	136	2-lamp ballasts		
1	F40T12/ES	0.5	MAG STD	Magnetic Standard	42	Tandem wired		
1	F40T12/ES	1	MAG STD	Magnetic Standard	48			
2	F40T12/ES	1	MAG STD	Magnetic Standard	82			
3	F40T12/ES	1.5	MAG STD	Magnetic Standard	122	Tandem wired		
3	F40T12/ES	2	MAG STD	Magnetic Standard	130			
4	F40T12/ES	2	MAG STD	Magnetic Standard	164	2-lamp ballasts		
1	F40T12/ES	0.5	MAGNETIC	Magnetic Energy Efficient	36	Tandem wired		
1	F40T12/ES	1	MAGNETIC	Magnetic Energy Efficient	43			
2	F40T12/ES	1	MAGNETIC	Magnetic Energy Efficient	72			
3	F40T12/ES	1	MAGNETIC	Magnetic Energy Efficient	105			
3	F40T12/ES	1.5	MAGNETIC	Magnetic Energy Efficient	108	Tandem wired		
3	F40T12/ES	2	MAGNETIC	Magnetic Energy Efficient	112			

\* Key for ballast factor (BF). RO=Reduced Output – BF=.70 to .85 NO=Normal Output – BF=.85 to 1.0  
HO=High Output – BF=>1.0

# LUMINAIRE POWER

Lamp		Ballast			Watts/	
No.	Designation	No.	Abbreviation	Description	Luminaire	Comments
<b>4 foot Fluorescent Rapid Start T12 ("Energy-Saving"34W) (Cont.)</b>						
4	F40T12/ES	2	MAGNETIC	Magnetic Energy Efficient	144	2-lamp ballasts
2	F40T12/ES	1	MAG HC	Magnetic Heater Cutout	58	
3	F40T12/ES	1.5	MAG HC	Magnetic Heater Cutout	87	Tandem wired
4	F40T12/ES	2	MAG HC	Magnetic Heater Cutout	116	2-lamp ballasts
2	F40T12/ES	1	MAG HC FO	Mag. Heater Cutout Full Light	66	
3	F40T12/ES	1.5	MAG HC FO	Mag. Heater Cutout Full Light	99	Tandem wired
4	F40T12/ES	2	MAG HC FO	Mag. Heater Cutout Full Light	132	2-lamp ballasts
1	F40T12/ES	0.5	ELECT	Electronic	30	Tandem wired
1	F40T12/ES	1	ELECT	Electronic	31	
2	F40T12/ES	1	ELECT	Electronic	62	
3	F40T12/ES	1	ELECT	Electronic	90	
3	F40T12/ES	1.5	ELECT	Electronic	93	Tandem wired
3	F40T12/ES	2	ELECT	Electronic	93	
4	F40T12/ES	1	ELECT	Electronic	121	
4	F40T12/ES	2	ELECT	Electronic	124	2-lamp ballasts
2	F40T12/ES	1	ELECT AO	Elec. Adjustable Output (to 15%)	60	
3	F40T12/ES	1.5	ELECT AO	Elec. Adjustable Output (to 15%)	90	Tandem wired
4	F40T12/ES	2	ELECT AO	Elec. Adjustable Output (to 15%)	120	2-lamp ballasts
<b>4 foot Fluorescent Rapid Start Standard (40W)</b>						
1	F40T12	0.5	MAG STD	Magnetic Standard	26	Tandem wired
1	F40T12	1	MAG STD	Magnetic Standard	52	
2	F40T12	1	MAG STD	Magnetic Standard	96	
3	F40T12	1.5	MAG STD	Magnetic Standard	144	Tandem wired
3	F40T12	2	MAG STD	Magnetic Standard	148	
4	F40T12	2	MAG STD	Magnetic Standard	192	2-lamp ballasts
1	F40T12	0.5	MAGNETIC	Magnetic Energy Efficient	44	Tandem wired
1	F40T12	1	MAGNETIC	Magnetic Energy Efficient	46	
2	F40T12	1	MAGNETIC	Magnetic Energy Efficient	88	
3	F40T12	1	MAGNETIC	Magnetic Energy Efficient	127	
3	F40T12	1.5	MAGNETIC	Magnetic Energy Efficient	132	Tandem wired
3	F40T12	2	MAGNETIC	Magnetic Energy Efficient	134	
4	F40T12	2	MAGNETIC	Magnetic Energy Efficient	176	2-lamp ballasts
2	F40T12	1	MAG HC	Magnetic Heater Cutout	71	
3	F40T12	1.5	MAG HC	Magnetic Heater Cutout	107	Tandem wired
4	F40T12	2	MAG HC	Magnetic Heater Cutout	142	2-lamp ballasts
2	F40T12	1	MAG HC FO	Magnetic Heater Cutout Full Light	80	
3	F40T12	1.5	MAG HC FO	Magnetic Heater Cutout Full Light	120	Tandem wired
4	F40T12	2	MAG HC FO	Magnetic Heater Cutout Full Light	160	2-lamp ballasts
1	F40T12	0.5	ELECT	Electronic	36	Tandem wired
1	F40T12	1	ELECT	Electronic	37	
2	F40T12	1	ELECT	Electronic	72	
3	F40T12	1	ELECT	Electronic	107	
3	F40T12	1.5	ELECT	Electronic	108	Tandem wired
3	F40T12	2	ELECT	Electronic	109	
4	F40T12	1	ELECT	Electronic	135	
4	F40T12	2	ELECT	Electronic	144	2-lamp ballasts
2	F40T12	1	ELECT RO	Electronic Reduce Output (75%)	61	
3	F40T12	1	ELECT RO	Electronic Reduce Output (75%)	90	
3	F40T12	1.5	ELECT RO	Electronic Reduce Output (75%)	92	Tandem wired
4	F40T12	2	ELECT RO	Electronic Reduce Output (75%)	122	2-lamp ballasts

**Fluorescent  
Rapid Start  
T12 (Cont.)**



## LUMINAIRE POWER

	Lamp		Ballast		Watts/	Comments	
	No.	Designation	No.	Abbreviation	Description		Luminaire
<b>Fluorescent Rapid Start T12 (Cont.)</b>	<b>4 foot Fluorescent Rapid Start Standard (40W) (Cont.)</b>						
	2	F40T12	1	ELECT TL	Elec. Two Level (50 & 100%)	69	
	3	F40T12	1.5	ELECT TL	Elec. Two Level (50 & 100%)	104	Tandem wired
	4	F40T12	2	ELECT TL	Elec. Two Level (50 & 100%)	138	2-lamp ballasts
	2	F40T12	1	ELECT AO	Elec. Adjustable Output (to 15%)	73	
	3	F40T12	1.5	ELECT AO	Elec. Adjustable Output (to 15%)	110	Tandem wired
	4	F40T12	2	ELECT AO	Elec. Adjustable Output (to 15%)	146	2-lamp ballasts
	2	F40T12	1	ELECT DIM	Electronic Dimming (to 1%)	83	
	3	F40T12	1.5	ELECT DIM	Electronic Dimming (to 1%)	125	Tandem wired
	4	F40T12	2	ELECT DIM	Electronic Dimming (to 1%)	166	2-lamp ballasts
<b>Fluorescent Rapid Start T10</b>	<b>4 foot Fluorescent Rapid Start T10 Extended Output (42W)</b>						
	2	F40T10/EO	1	MAGNETIC	Magnetic Energy Efficient	92	
	3	F40T10/EO	1.5	MAGNETIC	Magnetic Energy Efficient	138	Tandem wired
	4	F40T10/EO	2	MAGNETIC	Magnetic Energy Efficient	184	2-lamp ballasts
	2	F40T10/EO	1	MAG HC	Magnetic Heater Cutout	74	
	3	F40T10/EO	1.5	MAG HC	Magnetic Heater Cutout	111	Tandem wired
	4	F40T10/EO	2	MAG HC	Magnetic Heater Cutout	148	2-lamp ballasts
	2	F40T10/EO	1	ELECT	Electronic	74	
	3	F40T10/EO	1.5	ELECT	Electronic	111	Tandem wired
	4	F40T10/EO	2	ELECT	Electronic	148	2-lamp ballasts
	2	F40T10/EO	1	ELECT RO	Electronic Reduce Output (75%)	63	
	3	F40T10/EO	1.5	ELECT RO	Electronic Reduce Output (75%)	95	Tandem wired
	4	F40T10/EO	2	ELECT RO	Electronic Reduce Output (75%)	126	2-lamp ballasts
	2	F40T10/EO	1	ELECT TL	Elec. Two Level (50 & 100%)	72	
	3	F40T10/EO	1.5	ELECT TL	Elec. Two Level (50 & 100%)	108	Tandem wired
	4	F40T10/EO	2	ELECT TL	Elec. Two Level (50 & 100%)	144	2-lamp ballasts
	2	F40T10/EO	1	ELECT AO	Elec. Adjustable Output (to 15%)	73	
	3	F40T10/EO	1.5	ELECT AO	Elec. Adjustable Output (to 15%)	110	Tandem wired
	4	F40T10/EO	2	ELECT AO	Elec. Adjustable Output (to 15%)	146	2-lamp ballasts
	2	F40T10/EO	1	ELECT DIM	Electronic Dimming (to 1%)	85	
3	F40T10/EO	1.5	ELECT DIM	Electronic Dimming (to 1%)	128	Tandem wired	
4	F40T10/EO	2	ELECT DIM	Electronic Dimming (to 1%)	170	2-lamp ballasts	
<b>Fluorescent Rapid Start High Output</b>	<b>8 foot Fluorescent Rapid Start T8 High Output (86W)</b>						
	1	F96T8/HO	1	ELECT	Electronic	88	
	2	F96T8/HO	1	ELECT	Electronic	160	
	<b>8 foot Fluorescent Rapid Start T12 High Output ("Energy-Saving" 95W)</b>						
	1	F96T12/HO/ES	1	MAG STD	Magnetic Standard	125	
	2	F96T12/HO/ES	1	MAG STD	Magnetic Standard	227	
	2	F96T12/HO/ES	1	MAGNETIC	Magnetic Energy Efficient	208	
	2	F96T12/HO/ES	1	ELECT	Electronic	170	
	<b>8 foot Fluorescent Rapid Start T12 High Output ("Standard" 110W)</b>						
	1	F96T12/HO	1	MAG STD	Magnetic Standard	140	
	2	F96T12/HO	1	MAG STD	Magnetic Standard	252	
	2	F96T12/HO	1	MAGNETIC	Magnetic Energy Efficient	237	
	1	F96T12/HO	1	ELECT	Electronic	119	
	2	F96T12/HO	1	ELECT	Electronic	205	
	<b>8 foot Fluorescent Rapid Start T12 Very High Output ("Energy-Saving" 195W)</b>						
	1	F96T12/VHO/ES	1	MAG STD	Magnetic Standard	200	
	2	F96T12/VHO/ES	1	MAG STD	Magnetic Standard	325	
	<b>8 foot Fluorescent Rapid Start T12 Very High Output ("Standard" 215W)</b>						
1	F96T12/VHO	1	MAG STD	Magnetic Standard	230		
2	F96T12/VHO	1	MAG STD	Magnetic Standard	440		

# LUMINAIRE POWER

Lamp		Ballast			Watts/		
No.	Designation	No.	Abbreviation	Description	Luminaire	Comments	
<b>4 foot Fluorescent Slimline Energy-Saving T12 (32W)</b>							
1	F48T12/ES	1	MAG STD	Magnetic Standard	51	<b>Fluorescent Instant Start</b>	
2	F48T12/ES	1	MAG STD	Magnetic Standard	82		
<b>4 foot Fluorescent Slimline Standard T12 (39W)</b>							
1	F48T12	1	MAG STD	Magnetic Standard	59		
2	F48T12	1	MAG STD	Magnetic Standard	98		
<b>8 foot Fluorescent T8 Slimline (59W)</b>							
1	F96T8	1	MAGNETIC	Magnetic Standard	58		
2	F96T8	1	MAGNETIC	Magnetic Standard	120		
2	F96T8	1	ELECT NO*	Electronic Normal Output	110		
1	F96T8	1	ELECT HO*	Electronic High Output	72		BF~1.10
2	F96T8	1	ELECT HO*	Electronic High Output	151		BF~1.20
<b>8 foot Fluorescent T12 Slimline ("Energy-Saving" 60W)</b>							
1	F96T12/ES	1	MAG STD	Magnetic Standard	74		
2	F96T12/ES	1	MAG STD	Magnetic Standard	131		
2	F96T12/ES	1	MAGNETIC	Magnetic Energy Efficient	112		
1	F96T12/ES	1	ELECT	Electronic	70		
2	F96T12/ES	1	ELECT	Electronic	107		
<b>8 foot Fluorescent T12 Slimline ("Standard" 75W)</b>							
1	F96T12	1	MAG STD	Magnetic Standard	92		
2	F96T12	1	MAG STD	Magnetic Standard	158		
2	F96T12	1	MAGNETIC	Magnetic Energy Efficient	144		
1	F96T12	1	ELECT	Electronic	85		
2	F96T12	1	ELECT	Electronic	132		
<b>Mercury Vapor</b>							
1	H40	1	MAG STD	Magnetic Standard	51	<b>High Intensity Discharge</b>	
1	H50	1	MAG STD	Magnetic Standard	63		
1	H75	1	MAG STD	Magnetic Standard	88		
1	H100	1	MAG STD	Magnetic Standard	119		
1	H175	1	MAG STD	Magnetic Standard	197		
1	H250	1	MAG STD	Magnetic Standard	285		
1	H400	1	MAG STD	Magnetic Standard	450		
1	H1000	1	MAG STD	Magnetic Standard	1080		
<b>Metal Halide</b>							
1	M32	1	MAG STD	Magnetic Standard	42		
1	M35/39	1	MAG STD	Magnetic Standard	48		
1	M35/39	1	ELECT	Electronic	44		
1	M50	1	MAG STD	Magnetic Standard	68		
1	M50	1	ELECT	Electronic	58		
1	M70	1	MAG STD	Magnetic Standard	92		
1	M70	1	ELECT	Electronic	86		
1	M100	1	MAG STD	Magnetic Standard	122		
1	M100	1	ELECT	Electronic	110		
1	M125	1	MAG STD	Magnetic Standard	150		
1	M150	1	MAG STD	Magnetic Standard	186		
1	M150	1	ELECT	Electronic	168		
1	M175	1	MAG STD	Magnetic Standard	205		
1	M200	1	MAG STD	Magnetic Standard	232		
1	M225	1	MAG STD	Magnetic Standard	258		
1	M250	1	MAG STD	Magnetic Standard	295		
1	M320	1	MAG STD	Magnetic Standard	365		

\* Key for ballast factor (BF). RO=Reduced Output – BF=.70 to .85 NO=Normal Output – BF=.85 to 1.0  
HO=High Output – BF=>1.0

# LUMINAIRE POWER



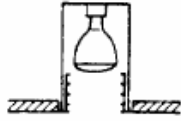



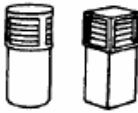









	Lamp		Ballast		Watts/	Comments	
	No.	Designation	No.	Abbreviation	Description		Luminaire
<b>High Intensity Discharge (Cont.)</b>	<b>Metal Halide (Cont.)</b>						
	1	M320	1	MAG LR	277v Linear Reactor	345	
	1	M320	1	ELECT	Electronic	345	
	2	M320	1	ELECT	Electronic Dimming	679	Dimming to 50%
	1	M350	1	ELECT	Electronic	375	
	2	M350	1	ELECT	Electronic Dimming	740	Dimming to 50%
	1	M360	1	MAG STD	Magnetic Standard	422	
	1	M360	1	MAG LR	277v Linear Reactor	388	
	1	M400	1	MAG STD	Magnetic Standard	461	
	1	M400	1	MAG LR	277v Linear Reactor	426	
	1	M400	1	ELECT	Electronic	430	
	2	M400	1	ELECT	Electronic Dimming	843	Dimming to 50%
	1	M450	1	MAG STD	Magnetic Standard	502	
	1	M450	1	MAG LR	277v Linear Reactor	478	
	1	M750	1	MAG STD	Magnetic Standard	820	
	1	M900	1	MAG STD	Magnetic Standard	990	
	1	M1000	1	MAG STD	Magnetic Standard	1080	
	2	M1000	1	ELECT	Electronic	2100	277 Volt
	1	M1500	1	MAG STD	Magnetic Standard	1650	
	1	M1650	1	MAG STD	Magnetic Standard	1810	
	<b>High Pressure Sodium</b>						
	1	S35	1	MAG STD	Magnetic Standard	44	
	1	S50	1	MAG STD	Magnetic Standard	61	
	1	S70	1	MAG STD	Magnetic Standard	93	
	1	S70	1	ELECT	Electronic Dimming	81	
	1	S100	1	MAG STD	Magnetic Standard	116	
1	S100	1	ELECT	Electronic Dimming	114		
1	S150	1	MAG STD	Magnetic Standard	173		
1	S150	1	ELECT	Electronic Dimming	166		
1	S200	1	MAG STD	Magnetic Standard	240		
1	S250	1	MAG STD	Magnetic Standard	302		
1	S250	1	ELECT	Electronic Dimming	285		
1	S400	1	MAG STD	Magnetic Standard	469		
1	S400	1	ELECT	Electronic Dimming	435		
1	S1000	1	MAG STD	Magnetic Standard	1090		
<b>Low Pressure Sodium</b>							
1	LPS18	1	MAG STD	Magnetic Standard	30		
1	LPS35	1	MAG STD	Magnetic Standard	60		
1	LPS55	1	MAG STD	Magnetic Standard	80		
1	LPS90	1	MAG STD	Magnetic Standard	125		
1	LPS135	1	MAG STD	Magnetic Standard	178		
1	LPS180	1	MAG STD	Magnetic Standard	220		
<b>Tungsten Halogen</b>	<b>12 Volt Tungsten Halogen Lamps Including MR16, Bi-pin, AR70, AR111, PAR36</b>						
	1	20 watt lamp	1	EPS	Electronic Power Supply	23	
	1	25 watt lamp	1	EPS	Electronic Power Supply	28	
	1	35 watt lamp	1	EPS	Electronic Power Supply	38	
	1	37 watt lamp	1	EPS	Electronic Power Supply	41	
	1	42 watt lamp	1	EPS	Electronic Power Supply	45	
	1	50 watt lamp	1	EPS	Electronic Power Supply	54	
	1	65 watt lamp	1	EPS	Electronic Power Supply	69	
	1	71 watt lamp	1	EPS	Electronic Power Supply	75	
	1	75 watt lamp	1	EPS	Electronic Power Supply	80	

## LUMINAIRE POWER

Lamp		Ballast			Watts/	
No.	Designation	No.	Abbreviation	Description	Luminaire	Comments
<b>12 Volt Tungsten Halogen Lamps</b>						
<b>Including MR16, Bi-pin, AR70, AR111, PAR36</b>						
1	100 watt lamp	1	EPS	Electronic Power Supply	106	
1	20 watt lamp	1	MT	Magnetic Transformer	24	
1	25 watt lamp	1	MT	Magnetic Transformer	29	
1	35 watt lamp	1	MT	Magnetic Transformer	39	
1	37 watt lamp	1	MT	Magnetic Transformer	42	
1	42 watt lamp	1	MT	Magnetic Transformer	46	
1	50 watt lamp	1	MT	Magnetic Transformer	55	
1	65 watt lamp	1	MT	Magnetic Transformer	70	
1	71 watt lamp	1	MT	Magnetic Transformer	76	
1	75 watt lamp	1	MT	Magnetic Transformer	81	
1	100 watt lamp	1	MT	Magnetic Transformer	108	

**Tungsten  
Halogen  
(Cont.)**

# TYPES OF LIGHT FIXTURES

<p>Roadway</p> 	<p>Fluorescent Troffer with Dropped Diffuser</p> 	<p>Recessed Baffle Downlight</p> 
<p>Parking Area</p> 	<p>Fluorescent Troffer with Plastic Egg-crate Diffuser</p> 	<p>Recessed Downlight with Regressed Fresnel Lens</p> 
<p>Area Post Tops</p> 	<p>Fluorescent Parabolic-louvered Troffer</p> 	<p>Recessed HID Parabolic-louvered</p> 
<p>Floodlight - HID and Incandescent</p> 	<p>Luminous Ceiling</p> 	<p>Track Light</p> 
<p>Wall Mount</p> 	<p>Fluorescent Modular with Prismatic Lens</p> 	<p>Drum Light</p> 
<p>Walkway Bollards</p> 	<p>Fluorescent Wraparound</p> 	<p>Pendant Sphere</p> 
<p>Garden/Walkway</p> 	<p>Fluorescent Strip</p> 	<p>Concentric Ring</p> 
<p>Landscape Uplights</p> 	<p>Industrial Fluorescent</p> 	<p>Industrial Dome</p> 
<p>Industrial HID - High Bay and Low Bay</p> 	<p>Fluorescent Open-Louvered</p> 	<p>HID Open Top Indirect Light</p> 

## TYPES OF LAMP CODES

Lamp Code	Lamp Description	Incan- descent Lamps
75A19	75.....Lamp wattage A.....Bulb shape 19.....Bulb diameter in eighths of an inch	
Lamp Code	Lamp Description	Fluores- cent Lamps
F32T8 RE830	4 ft Energy-efficient, rapid start F.....Fluorescent 32.....Lamp wattage T8.....Tube diameter in eighths of an inch RE830..Lamp color	<i>Lamp Color:</i> WW = Warm White CW = Cool White N = Natural D = Daylight 41 = 4,100K 35 = 3,500K 30 = 3,000K RE835 = Rare Earth, CRI over 80, 3,500K
F40T12 WW	4 ft Common, rapid start F.....Fluorescent 40.....Nominal lamp wattage T12.....Tube diameter in eighths of an inch WW.....Lamp color	<i>Energy saving:</i> SS = Sylvania "Super-saver" WM = GE "Watt-miser" EW = Philips "Econ-o-watt"
F40T12 CW/RS/ES	4 ft Energy saving, rapid start F.....Fluorescent 40.....Nominal lamp wattage CW.....Lamp color RS.....Rapid start ES.....Energy saving	
F96T12 CW/ES	Slimline, normally 8 ft. F.....Fluorescent 96.....Lamp length in inches T12.....Tube diameter in eighths of an inch CW.....Lamp color ES.....Energy saving	
F96T12 CW/HO/ES	High output, normally 8 ft. F.....Fluorescent 96.....Lamp length in inches T12.....Tube diameter in eighths of an inch CW.....Lamp color HO.....High output VHO.....Very high output ES.....Energy saving	

Lamp Code	Lamp Description	HID Lamps
	LU.....Type of HID lamp code, see table below 150.....Lamp wattage XXX.....Non-standard proprietary code	

Lamp Type	Philips	Sylvania	GE
Mercury Vapor	H	H	HR
Metal Halide	MH	MS	MV
High Pressure Sodium	C	LU	LU

# TECHNICAL NOTES

① RAPID START BALLASTS for 34 and 40 Watt Rapid Start Lamp										
Lamp Number and Type	Nom. Watts	Input Circuit (V)	Ballast Description*	Catalog Number	Cert.	Min. Temp.	Input Watts	Sound Rating	Fig. No.	Circuit Type
② ONE LAMP, HIGH POWER FACTOR										
(1)F40T12/RS ENERGY SAVING	34	120	Maxi-Miser II	8G1078W	ETL		45			
		277	Maxi-Miser II	8G1088W	ETL	60	47	A		LEAD
		120	Optimiser	M28-120-1F	-		37		42	
		277	Optimiser	M28-277-1F	-		38			
④ (1)F40T12/RS	⑤ 40	120	Watt-Miser	8G1074W	CBM	50	48		42	LEAD
		120	Maxi-Miser II	8G1078W	-	50	52	A	42	LEAD
		120	Low Temp.	8G3688W	-	0	54		22	LEAD
		120	Dimming	8G500AWF	-	50	50		15	LAG
		120	Optimiser	M28-120-1F	-	50	45		42	LEAD
③ TWO LAMP, HIGH POWER FACTOR										
(2)F40T12/RS ENERGY SAVING	34	277	Maxi-Miser II	8G1038W	ETL	60	77	A	14	SERIES L
		120	Optimiser	M28-120	-		59			
		277	Optimiser	M28-277	-		60			
(2)F40T12/RS	40	120	Quick Change kit	8G1022W10	CBM	50	96	A	14	SERIES L
		120	Watt-Miser	8G1024W	CBM	50	86	A	14	SERIES L
		120	Low Temp.	8G3905W	-	0	90	A	14	SERIES L
		120	Dimming	8G5007W	-	50	103	B	29	LAG
		120	Optimiser	M28-120	-	50	71	A	14	SERIES L
		120	Performance	E40-120-2	-	50	70	A	14	SERIES L
		240	Standard	8G3917W	-	50	92	A	14	SERIES L
		277	Standard	8G1032W	CBM	50	96	A	14	SERIES L
THREE LAMP, HIGH POWER FACTOR										
(3)F40T12/RS Energy Saving	34	277	Watt-Miser	8G1334W	-	60	106	A	28	SERIES L
(3)F40T12/RS	40	120	Performance	E40-120-3	-	50	109	A	28	SERIES L
		277		E40-277-3	-		109			

This procedure determines the luminaire power using catalog cuts. Use this procedure if a particular lamp/ballast combination is not in Table 5a or you wish to claim a lower value. Attach the catalog cuts with your compliance forms.

To determine the luminaire power using catalog cuts, follow the steps below:

### Step 1. Find the number and type of ballasts in each luminaire.

Fluorescent ballasts usually serve one or two lamps. Some serve three or four lamps. Luminaires may be wired in tandem. That means ballasts may serve lamps in two or more luminaires.

Example: A three-tube fluorescent luminaire may have the following combinations:

- (1) one-lamp ballast and (1) two-lamp ballast

- (1) three-lamp ballast, or
- (1) two-lamp ballast and (1) two-lamp tandem wired ballast, equivalent to (1.5) two-lamp ballast for each luminaire.

For HID lamps, each lamp usually has its own ballast.

### Step 2. Find the input wattage for each ballast type.

Ballast catalogs provide tested input wattages for ballast and lamp combinations. In most catalogs, seven items are required to determine input wattages:

1. Circuit type, such as "rapid start."
2. Number of lamps per ballast.
3. Ballast power factor – for example, "low" or "high" power factor.

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# TECHNICAL NOTES

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4. Number and type of lamp, such as “(2)F40T12/RS Energy Saving.”
5. Nominal lamp watts.
6. Input circuit voltage.
7. Ballast type, such as “standard,” “electronic,” “low temperature,” “dimming,” or a manufacturer’s ordering code.

Ballast catalogs may list more than one input wattage for a lamp/ballast combination. Use the tested or the American National Standard Institute (ANSI) value.

HID input wattage may be found in a luminaire catalog or a ballast catalog.

### Step 3. Calculate luminaire power.

Total the input wattage of each ballast type in the luminaire. If a ballast is tandem wired for two luminaires, use half the total ballast input.

#### Example 1

Three-tube fluorescent luminaire with:

- F40T12, 40 W lamps
- (1) one-lamp standard 120V magnetic ballast
- (1) two-lamp standard 120V magnetic ballast.

Using the figure above, ballast input wattages equal 52 and 96, respectively.

Luminaire Power = 52 + 96 = 148 W

#### Example 2

Three-tube fluorescent luminaire with:

- F40T12 energy-saving 34W lamps
- (1) Three-lamp energy-efficient (Watt-Miser\*) 120V magnetic ballast

Using the figure above, ballast input wattages equal 105.

Luminaire power = 105 W

#### Example 3

Three-tube fluorescent luminaire with:

- F40T12 energy-saving 34W lamps
- (1) Two-lamp and (1) two-lamp tandem wired 120V energy efficient (Maxi-Miser) magnetic ballasts.

Number of ballasts = three ballasts / two luminaires = 1.5 ballast per luminaire

Using the example catalog cut-sheet, the ballast input wattage equals 76 Watts.

Luminaire power = 1.5 x 76 = 114W