



NSTAR Indirect Low Glare Lighting

Project: _____

Date: _____

Completed by: _____

Fixture Description: _____

Instructions: Complete this Checklist and include in all NSTAR prescriptive and custom applications which include indirect low glare fixtures . Fixture and installation must comply with all NSTAR requirements to qualify for an incentive.

- Step 1: Does each 4ft section contain not more than two T8 or T5 standard output lamps or not more than one (1) T8 or T5 high output lamps?**
 - Yes or No _____

- Step 2: Are fixtures specifically designed for pendant installation?**
 - Yes or No _____

- Step 3: Is fixture efficiency greater than or equal to 80%?**
 - *Also known as "luminaire efficiency"* _____
 - Write in efficiency; attach test report and fixture cut sheet to document this.

- Step 4: Is the ceiling unobstructed with a white finish?**
 - Yes or No _____

- Step 5: Does the fixture have a downlight component that is between 0% and 30%?**
 - Write in % downlight; attach test report and fixture cut sheet to document this
 - *The % uplight and downlight can be found in the "Zonal Lumen Summary" in fixture test reports and cut sheets. In the example shown in Figure 1, the downlight component is 16.15% and the uplight is 83.85%.*

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	308	5.14	6.19
0-40	467	7.80	9.39
0-60	707	11.79	14.19
0-90	804	13.41	16.15
40-90	336	5.61	6.76
60-90	97	1.63	1.96
90-180	4177	69.62	83.85
0-180	4981	83.03	100.00

% "downlight" can be found in "% Fixture" column and the "0-90" zone.
 In this example % "downlight" is 16.15%.

Figure 1

- Step 6: Do fixtures with downlight incorporate glare limiting features such as louvers or perforated shields?** _____
 - Yes or no

- Step 7: Is the pendent length at least 16 inches?** _____
 - Write in approximate pendant length.

- Step 8: Is the system designed to achieve a maximum lighting power Density of 1.1 watts per sq ft?** _____
 - Write in LPD if calculated specific to the space or check the applicable configuration in Table 1.
 - For specific space types, allowable LPD may exceed 1.1 watts/sq ft. see Table 2

Table 1

LDP Estimator

Note: The following typical fixture configurations and layouts have been determined to yield an approximate LPD of no more than 1.1 W per sq ft. . Other fixture configurations and layouts may be eligible for incentives.

Type of System	Row Spacing for	
	16-20" Pendant Length	21-30" Pendant Length
T8 Systems		
1F32T8 lamp per 4 ft. of Fixture	7-11 ft.	9-12 ft.
2F32T8 per 4 ft. Section	9-12 ft.	10-13 ft.
1F32SuperT8 per 4 ft. Section	7-11 ft.	9-12 ft.
2F32SuperT8 per 4 ft. Section	9-12 ft.	10-13 ft.
T5 Systems		
1F28T5 per 4 ft. Section	8-10 ft.	9-13 ft.
2F28T5 per 4 ft. Section	10-12 ft.	11-13 ft.
1F54T5HO per 4 ft. Section	11-12 ft.	11-14 ft.

Table 2

LIGHTING POWER DENSITY TABLE

Lighting Power Densities Using the Building Area Method		
Building Type (A)	Mass. Energy Code (B)	Program Accepted (C)
Automotive Facility	1.5	1.2
Convention Center	1.4	1.1
Court House	1.4	1.1
Dining: Bar Lounge/Leisure	1.5	1.2
Dining: Cafeteria/Fast Food	1.8	1.4
Dining: Family	1.9	1.5
Dormitory	1.5	1.2
Exercise Center	1.4	1.1
Gymnasium	1.7	1.4
Hospital/Health Care	1.6	1.3
Hotel	1.7	1.4
Library	1.5	1.2
Manufacturing Facility	2.2	1.8
Motel	2.0	1.6
Motion Picture Theater	1.6	1.3
Multi-Family	1.0	0.8
Museum	1.6	1.3
Office	1.3	1.0
Parking Garage	0.3	0.2
Penitentiary	1.2	1.0
Performing Arts Theater	1.5	1.2
Police/Fire Station	1.3	1.0
Post Office	1.6	1.3
Religious Building	2.2	1.8
Retail	1.9	1.5
School/University	1.5	1.2
Sports Arena	1.5	1.2
Town Hall	1.4	1.1
Transportation	1.2	1.0
Warehouse	1.2	1.0
Workshop	1.7	1.4

Lighting Power Densities Using the Space-by-Space Method		
Space Type (A)	Mass. Energy Code (B)	Program Accepted (C)
Active Storage	1.3	1.0
Atrium – First Three Floors	1.3	1.0
Atrium – Each Additional Floor	0.2	0.2
Audience/Sitting Area	0.5	0.4
Classroom/Lecture/Training	1.6	1.3
Conference/Meeting/Multipurpose	1.5	1.2
Corridor/Transition	0.7	0.6
Dining Area	1.4	1.1
Electrical/Mechanical	1.3	1.0
Food Preparation	2.2	1.8
Inactive Storage	0.3	0.2
Lobby	1.8	1.4
Lounge/Recreation	1.4	1.1
Office – Enclosed	1.5	1.2
Office – Open Plan	1.3	1.0
Restrooms	1.0	0.8
Stairs – Active	0.9	0.7

Note: The presented list includes the most common space types. Please consult the Massachusetts Energy Code for more space types of and the allowed lighting power densities. For these spaces, determine the program accepted lighting power density by multiplying the code allowed lighting power density by 0.8.