



ENERGY STAR® Program Requirements for Solid State Lighting Luminaires

Proposed Category “A” Additions – Outdoor Area & Parking Garage

Category A: Near-term Applications

Outdoor pole-mounted area and roadway luminaires¹

Application Requirements					
Minimum Light Output		Luminaire shall deliver a minimum of 1,000 lumens (initial).			
Minimum Fitted Target Efficacy (lm/W)		Fitted Target Efficacy (FTE) evaluates the efficacy with which a luminaire delivers uniform illumination to a rectangular uniform area of coverage (the target area). FTE is calculated using standard absolute luminaire photometry (LM-79-08 test results in LM-63-02 formatted .ies file). Minimum requirements are given in initial lumens per watt of luminaire input power (lm/W). For DOE FTE calculator (beta version) please see http://www.drintl.com/temp/FTE-Calculator.exe . For calculator instructions, please see http://www.drintl.com/htmlmail/FTE_ReadMe.pdf . For supporting materials, please see http://www.drintl.com/htmlmail/FTEoverview01Jul09.pdf and http://www.drintl.com/htmlmail/FTEalgorithm01Jul09.pdf .			
		Shielded (< 1.5 MH house-side)		Unshielded (≥ 1.5 MH house-side)	
		Low Output < 9,500 lumens	High Output ≥ 9,500 lumens	Low Output < 13,300 lumens	High Output ≥ 13,300 lumens
		37	48	53	70
Maximum Luminous Flux in Glare and Uplight Zones [†]	FH (60-80°)	48.0% and 12,000 lumens			
	BH (60-80°)	20.0% and 5,000 lumens	48.0% and 12,000 lumens		
	FVH (80-90°)	3.0% and 750 lumens			
	BVH (80-90°)	3.0% and 750 lumens			
	UL (90-100°)	4.0% and 1000 lumens			
	UH (100-180°)	4.0% and 1000 lumens			

[†] Both requirements must be met for each BUG secondary solid angle: maximum percent of luminaire lumens in zone, and maximum lumens in zone. Secondary solid angles (zones) are per IES TM-15-07. FH-forward high; BH-back high; FVH-forward very high; BVH-back very high; UL-up low; UH-up high.

¹ Including but not limited to luminaires intended for lighting streets, parking lots, walkways, and plazas. Includes decorative post-top luminaires. Excludes luminaires intended to be mounted below eye level, e.g. bollards and steplights.

Outdoor wall-mounted area luminaires (“wall packs”)

Application Requirements		
Minimum Light Output	Luminaire shall deliver a minimum of 300 lumens (initial).	
Maximum Luminous Flux in Glare and Uplight Zones*	FH (60-80°)	48.0% of total luminaire output
	FVH (80-90°)	3.0% of total luminaire output
	UL (90-100°)	2.0% of total luminaire output
	UH (100-180°)	2.0% of total luminaire output
Minimum Luminaire Efficacy	52 lm/W	

*Secondary solid angles (zones) are per IES TM-15-07. FH-forward high; FVH-forward very high; UL-up low; UH-up high.

Parking garage/canopy luminaires

Application Requirements	
Minimum Light Output	Luminaire shall deliver a minimum of 2,000 lumens (initial).
Zonal Lumen Density Requirement	Luminaire shall deliver a minimum of 20% of total lumens in the 60°-70° zone.
Minimum Luminaire Efficacy	70 lm/W

Attachment A -- Definitions

Average-to-minimum ratio	A requirement establishing the greatest allowable difference between the average illuminance and the minimum illuminance measured in a given area. For example, to meet a 6:1 average-to-minimum ratio, the average illuminance value (lumens per unit of area, such as footcandles [lm/sq. ft.], lux [lm/m ²], or lumens per mounting height squared [lm/MH ²]) measured in a given area must not be more than six times the lowest value measured in that area.
BUG	Backlight, Uplight, and Glare Ratings defined in Addendum A to IESNA TM-15-07, Luminaire Classification System for Outdoor Luminaires.
House-side	The hemisphere behind the luminaire containing all backlight, i.e., opposite of street-side. Some controlled luminous flux in this region can be beneficial for mast-arm-mounted luminaires, luminaires located between sidewalk and street, luminaires along curving roads, etc.
Maximum-to-minimum ratio	A requirement establishing the greatest allowable difference between the maximum illuminance and the minimum illuminance measured in a given area. For example, to meet a 30:1 maximum-to-minimum ratio, the highest illuminance value measured in a given area must not be more than thirty times the lowest value measured in that area.
Mounting height (MH)	The vertical distance between finished grade and the optical center of the luminaire.
Shielded luminaire	Luminaire with a uniform area of coverage extending less than 1.5 times the mounting height (MH) in the backward (house-side) direction.
Uniform area of coverage	For purposes of this document: the “pool” of horizontal illumination covered to ratios of 30:1 maximum-to-minimum and 6:1 average-to-minimum. Both requirements must be met, i.e., max:min cannot be more than 30:1 and avg:min cannot be more than 6:1.