



# FOOTCANDLE LIGHT GUIDE

Footcandles are the most common unit of measure used by lighting professionals to calculate light levels in businesses and outdoor spaces. A footcandle is defined as the illuminance on a one square foot surface from a uniform source of light. The Illuminating Engineering Society (IES) recommends the following footcandle levels to ensure adequate illumination and safety for occupants. Below is a guideline for common areas to assist in achieving appropriate light levels with the greatest energy-efficiency.

Building Area & Task	Average Maintained Footcandles (Horizontal) (FC)	Range of Maintained Footcandles (Horizontal) (FC)	Average Maintained Footcandles (Vertical) (FC)	Range of Maintained Footcandles (Vertical) (FC)	Comments
<b>WAREHOUSING &amp; STORAGE</b>					
Bulky Items—Large Labels	10		5		
Small Items—Small Labels	30		15		
Cold Storage	20	10 - 30	10	5 - 15	
Open Warehouse	20	10 - 30			
Warehouse w/Aisles	20	10 - 30	10	5 - 15	
<b>COMMERCIAL OFFICE</b>					
Open Office	40	30 - 50			@30" Above Finished Floor (AFF)
Private Office	40	30 - 50			@30" AFF
Conference Room	30				Matte surface reflectance for the table 40% recommended
Restroom	18	7.5 - 30			
Lunch & Break Room	15	5 - 20			
<b>EDUCATIONAL (SCHOOLS)</b>					
Classroom	40	30 - 50			@30" AFF
<b>Gymnasium</b>					
Class I (Pro or Div. 1 College)	125		30		
Class II (Div. 2 or 3 College)	80		20		
Class III (High School)	50		150		
Class IV (Elementary)	30		100		
Auditorium	7.5	3 - 10	5	2.5 - 10	
Corridor	25	10 - 40			

This guide is a collaborative effort of Energy Trust of Oregon and the Lighting Design Lab, Seattle, Washington.

Building Area & Task	Average Maintained Footcandles (Horizontal) (FC)	Range of Maintained Footcandles (Horizontal) (FC)	Average Maintained Footcandles (Vertical) (FC)	Range of Maintained Footcandles (Vertical) (FC)	Comments
<b>INDUSTRIAL/MANUFACTURING</b>					
<b>Assembly</b>					
Simple (Large Item)	30	15 - 60	30	15 - 60	
Difficult (fine)	100	50 - 200	100	50 - 200	
<b>Component Manufacturing</b>					
Large	30	15 - 60	30	15 - 60	
Medium	50	25 - 100	50	25 - 100	
<b>EXTERIOR</b>					
Parking (Covered)	5				1FC min, 10:1 Max to Min Uniformity
<b>Parking (Open) (Medium Activity)</b>					
Lighting Zone 3 (Urban)	1.5	.75 - 3	.8	.4 - 1.6	
Lighting Zone 2 (suburban)	1	0.5 - 2	.6	.3 - 1.2	
Gas Station Canopy	12.5	10 - 15			
Safety (Building Exterior)	1	0.5 - 2			If security is an issue—raise average level to 3
<b>RETAIL</b>					
General Retail (Ambient)		50			
Department Store	40	20 - 80	15	7.5 - 30	
Perimeter			75	35 - 150	
Accent Lighting (Displays)					3 - 10 times greater than ambient light levels
<b>AUTOMOTIVE</b>					
Showroom	50	25 - 100	10	5 - 20	
Service Area	50	25 - 100	30	15 - 30	
<b>Sales Lot (Exterior)</b>					
Lighting Zone 3 (Urban)	20	10 - 40	20	10 - 40	
Lighting Zone 2 (Suburban)	15	7.5 - 30	15	7.5 - 30	
<b>GROCERY</b>					
Circulation	20	10 - 40	7.5	3.5 - 15	
General Retail	50	25 - 100	20	10-40	
Perimeter			50	25-100	
<b>BANKING</b>					
ATM	20	10-40	15		Vertical at face of ATM

- NOTES:
- This guide is based on information gathered from the IES 'The Lighting Handbook' 10th Edition. It is highly recommended that all lighting professionals refer to the full IES guide when specifying lighting projects.
  - At least half of users are in the 25 - 65 age range
  - Horizontal—horizontal plane that average maintained foot-candle are measured
  - Vertical—vertical plane that average maintained foot-candle are measured
  - It is the responsibility of the specifier to determine and provide appropriate lighting levels for each space