

INDUSTRIAL APPLICATIONS

Technology is our specialty: Industrial lighting by LaserLight Inc.

Industrial work-spaces have their own sets of lighting priorities, depending on the industrial processes that are performed in them. The Recommended Practice for Industrial Lighting (IES RP7-14) recommends illuminance levels, but also discusses other important issues for the lighting design. Most important is what is called “the Task”. This includes not only “what” the task is (i.e. “welding”) but also the location and orientation of the task (i.e. “under an aircraft wing”).

Uniformity: This is how “even” the lighting is, with maximum and minimum intensities being very similar to each other (no “bright” or “dim” spots). Industrial lighting design requires that the Uniformity Ratio is no greater than 3.0-to-1. Example: Maximum= 75ftC (brightest spot on the floor) and Minimum=25ftC (dimpest spot on the floor).

Glare is experienced when a very bright light (or reflection) makes it difficult to see the work-piece. With very bright lights mounted 25 or 30 feet above the floor, may not cause much of a glare issue when looking down or across the bay, but reflections from the task can cause accidents/injury.

Stroboscopic Effect: This is an issue with rotating machinery such as lathes, mills, drills, sanding disks and other reciprocating machinery. Certain types of lighting can lead to industrial accidents/injury. High Pressure Sodium and older Fluorescent lighting systems operate at 60 cycles per second; a lathe rotating at 3600 RPM will appear to have “stopped” when viewed under these sources.

Vertical Illuminance is important if the Task is oriented to vertical surfaces. Common recommendations for vertical illumination is a ratio of One-to-two or one footcandle vertical for every two footcandles horizontal. However if the task is vertical a 1:1 requirement may be warranted.

Safety Lighting: Even basic navigation through an industrial space is not as simple as it might seem. Dangerous areas such as refineries, steel mills, foundries where many surfaces are hot may need increased illumination levels for quick evacuation.

Industrial Point-by-Point Layout



Because you don't need ALL the lights on ALL the TIME

Flexibility makes a difference. Here's how controls are used.

Generally, industrial spaces are operated on a shift-based work system. But within the work area, many different tasks can be taking place, requiring different lighting levels. Thus, it does not make economic sense to keep all the lights on ALL the TIME, or ALL the lights at the SAME Intensity.

A network control system can solve these issues. A "scene" can be created for each bay, with some fixtures at full intensity, and others at mid, or low intensity. Still others might be turned OFF if they are near skylights or open doors, but only during the day. Therefore, "scene control" and scheduling of the scene are the primary features to provide enough light for the tasks, and save energy. The scene for first shift can be set to produce as much light as needed for some work-stations, less light for others, and no man-made light near an overhead door that remains open.

Daylight harvesting controls can change the light levels, as required where sunlight can be used; Motion controls can be utilized during some work periods, but "ignored" during times of no production, where minimal "night light" illumination is programmed, and motion might cause more energy to be used than necessary.

Workers with periodic, or sporadic work-hours can have a special scene for just their work areas (plus a path of egress) and be activated with an RFID card when they "clock-in" . . .

Industrial/Manufacturing Energy Calculator						
		Cost of Energy (\$/KwH)	\$0.12			
				3-step dimming With Controls (80/20 rule)	4-step dimming With Controls (80/20 rule)	
WITH NO CONTROLS (100% or OFF)						
Lighting Equipment	Present Lighting HID HighBays	LaserLight Luminaires T5 High Bays		LaserLight Luminaires with Point/Dim controls		
number of lamps/fixt	1	6		6		
Maintained Lumens per lamp	23500	4420		4420		
Lumens per Fixture	23500	26520		26520		
Average Illumination	49	51		variable		
Number of Fixtures	100	100		100		
Cost per fixtures	\$0.00	\$250.00				
Total number of lamps	100	600		600		
Total number of Lumens	2350000	2652000		2652000		
Fixture Efficiency	0.889	0.969		0.969		
Effective Lumens to floor	2089150	2569788		2569788		
Watts per fixture	455	356		356/118		356/27
Total Watts	45500	35600				
Number of Hours/year	7200	7200	energy saved	variable	Energy Saved	variable
Cost of Energy	\$39,312.00	\$30,758.40	\$8,553.60	\$14,273.28	\$25,038.72	\$7,983.36
Cost of Equipment	0	\$25,000.00				\$43,400
Years to pay back			2.9	1.7		1.4
WITH POINT/DIM CONTROLS (100% / 67% / 33% / OFF)						

