LED Lighting for:
Warehouses & Distribution Centers

Flex Lighting Solutions
Reducing energy and operational costs, while maximizing productivity and safety, are the biggest challenges warehouse facility owners and managers face.
Safer and More Productive Workspaces

Good lighting creates a productive working environment for employees.

Glare and inadequate lighting levels cause eye strain, headaches, reduced productivity and poor concentration which can lead to frequent mistakes and accidents.

Not only are proper lighting levels required, the right color temperature and color rendering for each task can contribute to an increase in productivity.

Comparing the average cost per hour of a warehouse employee versus the cost of a kWh, a gain as small as 1% in productivity beats any kind of energy savings from not having the optimal illumination levels.

Choosing the correct lighting system in warehouses and distribution centers is crucial for the safety, productivity and comfort of employees.
Saving Energy in 24/7 Environments

Warehouses and distribution centers never sleep

Besides storing goods and materials, workers perform diverse tasks at all times such as loading, sorting, picking and inspecting.

In most warehouses, artificial light is needed at all times and lighting is one of the biggest energy costs, making up 40% of the facility’s energy expense.
Many warehouses are semi-conditioned or non-conditioned spaces. As heat rises, hot air gets trapped in the ceiling, and over time, it is common to have ambient temperatures at the mounting height of the light fixture reaching 55°C and even 65°C.

The only way to have a well-lit warehouse for many years is to install LED fixtures designed and rated for high ambient temperatures.

Our Essentials Series 4.0 provides a nearly constant light output over 10 years, unlike conventional light sources or inferior LED fixtures that lose light dramatically in just a few months.
Reducing your TOTAL COST OF OWNERSHIP

Think twice before buying the cheapest fixtures you see.
They may come at an unexpected price, ending up costing as much as three times the initial investment versus spending money on high quality LED fixtures.

Conventional light sources are expensive to operate while cheap LEDs will not sustain the advertised efficacy, life and light output you expect, forcing you to buy again after a short period of time.

Example:

200 fixtures

| HID 458W | VS. | 6L T5HO 54W 356W | VS. | Essentials Series 4.0 145W |

Lower Energy Bills
with higher energy efficiency
Essentials Series 4.0 needs less wattage than similar light fixtures to deliver the same light output, increasing energy savings.

Reduced Maintenance
with longer lasting LED fixtures
LED fixtures made by Flex Lighting Solutions have a longer life span than conventional light fixtures and most competitor LEDs, helping you reduce maintenance costs and time spent replacing lamps, ballasts and drivers.

TOTAL COST OF OWNERSHIP OVER 10 YEARS (24/7)

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71% lower cost of ownership vs.
62% lower cost of ownership vs.

Energy cost: $0.10/kWh, 24/7 usage. HID (life: 20Khrs, lamp: $12, ballast: $40). T5HO (life: 30Khrs, lamps (6): $3 each, ballast: $50), Labor: $80/hr.

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Responsive Illumination

Lighting On Demand, When and Where Needed

Our LED fixtures with integrated occupancy sensors control lighting levels in unoccupied areas to maximize energy savings. When activity is detected, light levels go up instantly to meet the required illumination for people working in that area.

After a period of inactivity, the sensors turn the light fixtures off or dim them to a preset level, achieving additional energy savings.

Our occupancy sensors include a daylight function that constantly measures the light coming from other sources and sets the lumen output according to the requirements of each area.

In most warehouses, some areas are often not in use. Lighting control systems ensure proper illumination at all times, increasing energy savings and safety.
IoT and Industry 4.0 Ready

Manage your facilities from anywhere with cloud-based systems, collect data to gain insights and optimize your business.

Our LED fixtures can easily connect with IoT devices and building management systems. You can set limits of consumption, create illumination scenes by zones, define minimum and maximum lighting levels, program time schedules, measure activity by area, monitor fixture status, and receive insights that help to optimize your business operations, reduce operating costs and increase productivity.

Fixtures Integrating your Choice of Controls

Flex Lighting Solutions is controls agnostic, letting you choose which control system you want us to install in our LED fixtures. Our standard offering includes controls from WattStopper, IR-TEC and EnOcean.

Maximum Flexibility with EnOcean Wireless Controls

Reduce infrastructure complexity and installation costs with our LED fixtures equipped with EnOcean wireless controls.

Our fixtures can be ordered with an integrated control module that connects to the EnOcean portfolio of wireless self-powered sensors and switches for maximum flexibility and maintenance-free installations.
Benefits of a Well-lit Warehouse

A well-designed lighting system needs to provide adequate illuminance and uniformity for each area and task. When proper levels are met, workers experience better visibility and higher concentration which increases accuracy, productivity and reduces errors.

Reduced Picking Errors and Increased Profits

Picking the wrong item or shipping the wrong box are expensive issues, hurting the reputation and profitability of your business. Returns and expedited shipments, corrections, refunded orders, and losing loyal customers can add up to thousands of lost revenue in a year.

Higher Productivity

When optimal illuminance levels are met with good uniformity and low glare, workers experience better visibility and productivity. Fixtures with good lighting levels but too much glare can make workers feel uncomfortable and may cause visual fatigue, tiredness, and headaches.

Accident Prevention

In warehouse and distribution centers, walking or driving forklift trucks represent a high risk if employees cannot see the floor or obstacles properly due to inadequate lighting.

IES Illuminance Recommendations

Minimum requirements in footcandles

<table>
<thead>
<tr>
<th>Task</th>
<th>Horizontal Target ($E_{h}$)</th>
<th>Vertical Target ($E_{v}$)</th>
<th>Uniformity Target</th>
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<tbody>
<tr>
<td>Loading</td>
<td>10 - 20</td>
<td>3 - 6</td>
<td>3:1</td>
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<tr>
<td>Receiving / Staging</td>
<td>30 - 60</td>
<td>10 - 20</td>
<td>2:1</td>
</tr>
<tr>
<td>Packing / Labeling</td>
<td>30 - 60</td>
<td>15 - 30</td>
<td>3:1</td>
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<tr>
<td>Picking / Classifying</td>
<td>10 - 20</td>
<td>5 - 10</td>
<td>3:1</td>
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<tr>
<td>Inactive Storage (bulky items, large labels)</td>
<td>10 - 20</td>
<td>5 - 10</td>
<td>5:1</td>
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<tr>
<td>Active Storage (small items, small labels)</td>
<td>30 - 60</td>
<td>15 - 30</td>
<td>3:1</td>
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<tr>
<td>Inspection</td>
<td>100 - 200</td>
<td>100 - 200</td>
<td>3:1</td>
</tr>
</tbody>
</table>


A Note About Lighting Levels

Higher lighting levels may be required depending on the color and reflectivity of the ceilings, walls and floors. Dark colored surfaces require more illumination than light-colored or highly-reflective ones. Size of elements stored in the warehouse influence the quality of lighting as well.
Recommended Products

Essentials Series 4.0
LED High Bay with the Highest Performance and Life

Model 6M
6 LED Modules, Long Frame

- Lumen Range
  43,000 lm to 73,000 lm

- High Efficacy
  up to 168LPW

- Ultra-Long Life
  L70 at 309,000 hours

- Rotatable Outer Modules
  0°, 45°, 90°, 135°

Aluminum Heatsinks and Wireway
Lightweight, durable and designed for maximum heat evacuation, allowing ambient temperatures up to 65°C

Wireless Controls
Integrated EnOcean Module available as an option

Knockout for Integrated Sensors
Occupancy and Ambient Light Detection

Clear, Frosted and Aisle Lenses available
Clear and Frosted: Area lighting with high uniformity. Aisle: Directs the light to the center of aisles and to the floor.

Dimmable Driver

Mounting Options
- Surface Mount
- Hook and Loop
- Hanger
- Rigid Stem
- Plate Mount

Dust Resistant and Wet Location Rated
Available as options

- PATENTS PENDING -

Other Recommended Models (same features as above)

Model 6MS
21,000 lm to 41,000 lm

Model 4M
31,000 lm to 54,000 lm

Model 4MS
13,000 lm to 27,000 lm

Flex Lighting Solutions
Improved Warehouse Illumination

The Best Optical Solution for Every Warehouse Application

Clear Lenses for Horizontal Illumination of Open Areas

Our Clear Lenses and Frosted Lenses provide the best uniformity in the horizontal plane. Loading docks, work desks, and floor obstacles require excellent horizontal light levels and uniformity to ensure employees can see properly.

Aisle Lenses for Vertical Illumination of Racks

Our exclusive Aisle Lenses aim most of the light towards the middle of the floor and racks, avoiding wasted light in aisle applications and providing higher levels of vertical illumination which help employees read labels and find items on racks faster compared to other light fixtures.

Narrow Lenses for Focused Illumination

Our new Narrow Lenses concentrates the light down, achieving the highest illumination levels on the floor, and good vertical illumination for narrow aisle racks.

Rotatable Outer Modules

Essentials Series 4.0 feature rotatable outer modules that can be set at 0°, 45°, 90° and 135° allowing customization of light distribution, uplight capability, and flexibility to adapt to future lighting needs in a facility.
Improved Warehouse Illumination

More Efficient and Better-lit Warehouses with Essentials Series

MODELS USED

FOR RACKS
ES40P-A1-17K-4MS
Quantity: 264
Lumens: 17,818 lm
Lenses: Aisle

FOR OPEN AREAS
ES40P-A1-21K-6MS
Quantity: 154
Lumens: 21,743 lm
Lenses: Clear

RESULTS

25 fc avg. in the RACKS
1.75:1 uniformity

30 fc avg. in OPEN AREAS
2.25:1 uniformity

BENCHMARK: POWER CONSUMPTION AT SAME LIGHTING LEVELS

Essentials Series 4.0
Quantity: 418 (264 + 154)
Wattage: 48,642 W

Fluorescent 6L T5HO 54
Quantity: 486
Wattage: 181,764 W

Metal Halide 400 W
Quantity: 502
Wattage: 229,916 W

WAREHOUSE FLOOR PLAN

Space Characteristics
Size: 250,000 sq.ft.
Reflectances:
• Ceiling 65%
• Wall 50%
• Floor 20%
Ceiling Height: 33’
Fixture Mounting: 30”
Racking Height: 28’
Calc. Plane Height: Floor
Fixture Spacing: 26 x 26 ft

Flex Lighting Solutions
Port City Logistics Upgrades to LED Lighting, Increases Safety and Productivity

Company: Port City Logistics  
Partner: LED Lowcountry  
Location: Savannah, GA  
Building: Warehouse, 180,000 sq ft

Project: Port City Logistics converted one of their warehouses from food to bulk storage. This change required a new floor plan and reconfigured aisle racking with new lighting requirements.

Challenge: After the conversion, the old T5 fixtures were in the wrong place and products stacked on racks were blocking most of the light. On top of the placement issue, the old fixtures were not providing sufficient illuminance and were causing high costs in energy and relamping, with added potential hazards regarding shattered glass and mercury spread on the floor from broken lamps.

Solution: To meet the new lighting requirements, fixture count increased from 143 8-lamp T5 fluorescent fixtures to 203 Essential Series 4.0 LED high bays. These new high bays were set to 23,000 lm for the open areas and 15,000 lm for the aisles; the latter equipped with special aisle lenses to direct the light to the floor. All LED fixtures included occupancy sensors to dim the lights in zones with no activity and integrated photocells that measure natural light to adjust light output, providing the optimal illumination levels while saving energy.

Key Results

$215,000  
total savings over 10 years

86%  
energy reduction

OLD  
5 fc

Flex  
15 fc

“Before the Flex LED lighting upgrade, operators were spending more time pulling orders for customers. Since the retrofit, productivity increased as well as the light levels and now it’s a more safe and efficient work environment.”

Jed Young  
Director Business Dev. - Port City Logistics
Memphis Warehouse Speeds Up Picking Times After Installing Essentials Series LED Fixtures

Company: Flex
Location: Memphis, USA
Building: Warehouse, 267,000 sq ft

Project: The Memphis warehouse was poorly lit with lighting levels of just 7 to 9 foot candles. When Henry, the facilities supervisor, received an internal document stating the minimum required lighting levels were supposed to be 32 foot candles, he quickly set out to replace the company’s T8 High Bay fluorescent fixtures.

Challenge: Lighting levels were grossly under the minimum. Employees complained for years it was hard to pick parts because it was difficult to see the correct part numbers in the dark warehouse aisles, and some joked the company should invest in headlamps to speed up picking.

Solution: The warehouse installed a total of 558 Essentials Series LED High Bays. The old fluorescent 2x4 and 2x8 fixtures were replaced with smaller and more efficient 2x2 and 2x4 LED fixtures. The day after each new area sported the new lights, “employees were all excited that they could see part numbers in the aisles”, Henry said.

“Managers can now look across the warehouse and identify workers by name because they can see them so well. Previously, you couldn’t make them out before.”
Dwayne Henry - Facilities Supervisor

Installed Fixtures

558 x Essentials Series 3.2 6M

Key Results

- Improved working conditions
- Increased safety and higher productivity
- Reduced employee complaints
- Lowered energy costs
Flex Lighting Solutions is a global manufacturer of innovative, reliable and high-performance LED fixtures for industrial and commercial applications. We help businesses and property managers lower their utility bills, meet energy efficiency targets and reduce their total cost of ownership.

### Why Flex Lighting Solutions?

- **Best Thermal Management**
  - Our LED luminaries are designed to perform at higher ambient temperatures than others.

- **Superior Lumen Maintenance**
  - Our LED fixtures maintain higher lighting levels over time than other LED products.

- **Lowest Total Cost of Ownership**
  - We provide the best combination of cost, efficacy and life for your lowest total cost of ownership.

- **Warranty Replacement**
  - We stand behind the quality and performance of our products with an up to 10-year warranty.

- **Responsive Customer Support**
  - Our inside sales and technical support teams are experienced to solve all your lighting needs.

- **QuickShip Program**
  - Access to our fastest-moving fixtures. We guarantee your order will ship in 2 business days.