LED Lighting for:
Food & Beverage Processing Facilities

Flex Lighting Solutions
Safety, productivity, and cleanliness are critical to the success of any food and beverage facility.
A Safe and Sanitary Environment

The food and beverage industry is held to the highest standards of cleanliness, sanitation protocols and strict inspections.

Lighting in these environments must withstand contaminants, airborne oils, grime, dust, mist, steam, water, and cleaning solvents. The National Sanitation Foundation International (NSF) defines three zones for equipment used in food processing environments based on area conditions and if there is direct or indirect contact with food.

<table>
<thead>
<tr>
<th>NSF Certification</th>
<th>Typical Lighting Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Food Zone</td>
<td>Kitchen, Food Storage,</td>
</tr>
<tr>
<td></td>
<td>Dry Process Areas,</td>
</tr>
<tr>
<td></td>
<td>Damp Process Areas</td>
</tr>
<tr>
<td>Splash Zone</td>
<td>Wet or Damp Process Areas,</td>
</tr>
<tr>
<td></td>
<td>High Pressure Purging</td>
</tr>
<tr>
<td></td>
<td>and/or Decontamination,</td>
</tr>
<tr>
<td></td>
<td>Areas Using Hose Wash-Downs</td>
</tr>
<tr>
<td>Food Zone</td>
<td>Not Applicable for Lighting</td>
</tr>
</tbody>
</table>

In the **Non-Food Zone**, there is no direct contact with food under normal operations. Fixtures are not exposed to splashes or wash-downs but they need to resist cleaning solvents, dirt and debris.

In the **Splash Zone**, direct contact with food is not expected but liquids used in the processing or cleaning procedures may splash, spill or soil the fixture surface. Frequent high-pressure hose wash-downs are performed.

In the **Food Zone**, direct contact with food is normally expected. This certification applies to equipment not related to lighting, such as cutting boards and work tables.
Meeting NSF Requirements for Food Processing Equipment

The **Hosedown Series** is NSF certified by the National Sanitation Foundation International on the standard NSF/ANSI 2. This includes requirements for material safety, design, construction and product performance to ensure food protection and sanitation.

The NSF certification indicates the fixture and the manufacturing facility where the fixture was made have passed a battery of tests pertaining the stringent requirements of the FDA and USDA.

NSF recommends avoiding glass for safety reasons in case of impact, as well as painted surfaces as they could chip and contaminate the food.

The housing of the **Hosedown Series** is made from unpainted fiberglass reinforced plastic and a **corrosion-resistant, non-toxic** material that will not melt or burn. Unlike other fixtures, Hosedown Series is **mercury-free**.
Withstanding High Pressure Wash Downs

The NSF requires food and beverage processing equipment, including lighting, to withstand close range high pressure wash down processes with hot water and/or sterilization chemicals to prevent bacterial growth, fungus and the appearance of other contaminants.

**Hosedown Series resists wash down pressures up to 1500psi**

ensuring the safety of its electrical components, even while turned on.

**TESTED & CERTIFIED**

- IP65, IP66
- IP67, IP69K
- NEMA 4X
Ingress Protection (IP) Rating

A standard published by the IEC classifying the degrees of protection of electrical enclosures against the intrusion of external agents. The first digit defines protection against solid objects and the second digit represents resistance to liquids.

<table>
<thead>
<tr>
<th>Solid Objects</th>
<th>Liquid Ingress</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 None</td>
<td>0 None</td>
</tr>
<tr>
<td>1 Ø ≥ 50mm</td>
<td>1 Dripping water</td>
</tr>
<tr>
<td>2 Ø ≥ 12.5mm</td>
<td>2 Dripping water (tilted at 15°)</td>
</tr>
<tr>
<td>3 Ø ≥ 2.5mm</td>
<td>3 Spraying water</td>
</tr>
<tr>
<td>4 Ø ≥ 1mm</td>
<td>4 Splashing of water</td>
</tr>
<tr>
<td>5 Dust Protected</td>
<td>5 Water jets</td>
</tr>
<tr>
<td>6 Dust Tight</td>
<td>6 Powerful water jets</td>
</tr>
<tr>
<td>7 Short term immersion (up to 1m)</td>
<td></td>
</tr>
<tr>
<td>8 Submersion (beyond 1m)</td>
<td></td>
</tr>
<tr>
<td>9K Powerful high temp water jets</td>
<td></td>
</tr>
</tbody>
</table>

In blue, the highest test passed by Hosedown Series.

NEMA Rating for Enclosures

The National Electrical Manufacturers Association (NEMA) actively promotes standardized product specifications and gives electrical component enclosures ratings based on their protective qualities.

<table>
<thead>
<tr>
<th>Protection Against</th>
<th>NEMA Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to hazardous parts</td>
<td>• • • • •</td>
</tr>
<tr>
<td>Ingress of solid foreign objects (falling dirt)</td>
<td>• • • • •</td>
</tr>
<tr>
<td>Ingress of water (dripping, light splashing)</td>
<td>• • • •</td>
</tr>
<tr>
<td>Ingress of solid foreign objects (windblown dust, lint, fibers, flyings)</td>
<td>• •</td>
</tr>
<tr>
<td>Ingress of water (rain, snow, sleet)</td>
<td>• •</td>
</tr>
<tr>
<td>Ingress of water (hosedown)</td>
<td>• •</td>
</tr>
<tr>
<td>Corrosive agents</td>
<td>•</td>
</tr>
</tbody>
</table>

In blue, tests passed by the Hosedown Series.
Lowering Maintenance Costs

All LED fixtures of the **Hosedown Series** are made with a sturdy housing and a rugged design to last longer and endure accidental impacts.

- **Highly Protective Housing**: Safeguards LEDs and electronics from external agents.
- **Best-in-Class Thermal Design**: Allows uninterrupted, long-lasting performance of LEDs and drivers in harsh environments under cold and hot ambient temperatures.
- **Easier Access to Wiring and Components**: No tools needed, enabling easier and quicker routine maintenance which reduces shutdown times and labor costs.
Increased Energy Savings in HVAC

The highly efficient Hosedown Series reduces the wattage in lighting compared to traditional fixtures. As these fixtures produce significantly less heat to deliver the same amount of light, less refrigeration is needed to maintain the desired temperature conditions.

**Refrigerated Warehouse End Use Load**
Typically 54% of the energy used in cold storage facilities come from refrigeration.

![Refrigerated Warehouse End Use Load Diagram](image)

Source: National Grid. “Demand Response Programs, Shared Demand Response Sample Audit”. 2004

Depending on the temperature, it takes 0.5 to 2 watts of cooling power to offset each watt of power consumed by a light source.

![Refrigerated Warehouse Image](image)

**Flex**

<table>
<thead>
<tr>
<th>Traditional Fixture</th>
<th>Cooling Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>240W</td>
<td>up to 480W</td>
</tr>
</tbody>
</table>

**Traditional**

<table>
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</tr>
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</tbody>
</table>

**Flex**

<table>
<thead>
<tr>
<th>Flex LED Fixture</th>
<th>Cooling Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>76W</td>
<td>up to 152W</td>
</tr>
</tbody>
</table>

**Hosedown Series 2.0 model 2N 12K lm vs T8 fixture delivering a similar light output**

Up to 300% energy savings vs. Traditional

Hosedown Series 2.0 model 2N 12K lm vs T8 fixture delivering a similar light output

Flex Lighting Solutions
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:

| 100 fixtures | HID 458W | VS. | 4L T5HO 54W 238W | VS. | Hosedown Series 2.0 112W |

**Lower Energy Bills**

with higher energy efficiency
Hosedown Series 2.0 is the industry’s most efficient vaportight fixture, delivering maximum energy savings.

**Reduced Maintenance**

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

![Graph showing total cost of ownership over 10 years (24/7)]

Rugged Housing, Non-Toxic and Corrosion Resistant
Injection molded UL 94 5VA fiberglass housing (will not melt or burn) and non-painted to prevent contamination.

Food Grade Latches
Available in plastic and stainless steel. Provides tool-less access to all components and wiring in seconds.

Emergency Battery Backup (optional)
Up to 90 minutes duration.

Strong Ingress Protection
Up to IP69K and NEMA 4X Rated. Meets NSF Splash Zone 2.

Sturdy Lenses Made from Non-Toxic Materials
Acrylic and UV stabilized. Improves illumination and lasts longer.

Internal Occupancy Sensor
Fully protected from the environment. Doppler technology.

Recommended Products

**Hosedown Series 2.0**
Industry’s Most Efficient Vaportight Fixtures

**Model 4N**
4ft Narrow Housing

- **Lumen Range**: 12,000 and 24,000 lm
- **High Efficacy**: up to 168LPW
- **Ultra-Long Life**: L70 at 235,000 hours
- **Water Pressure**: up to 1,500 psi

**Other Recommended Models** (same features as above)

**Model 2N** - 2ft Narrow Housing
Industry’s smallest 12,000 lm vaportight LED fixture

**Model 2W** - 2ft Wide Housing
Industry’s smallest 30,000 lm vaportight LED fixture

Also available in 6,000 lm
Also available in 18,000 lm and 24,000 lm
The Highest Efficacy in Cold Storage

Unlike typical fluorescent light sources which suffer a significant reduction of light output at cold temperatures, LEDs improve their performance and life.

Our Hosedown Series LED fixtures provide the same or brighter illumination levels with less fixtures versus fluorescent, reducing your overall lighting costs.
Improved Cold Storage Illumination

More Efficient and Better-lit Facilities with Hosedown Series

MODELS USED

FOR RACKS
HD20S-A1-12K-4N
Quantity: 65
Lumens: 12,112 lm
Lens: Clear Ribbed

FOR OPEN AREAS
HD20S-A1-24K-4N
Quantity: 12
Lumens: 24,419 lm
Lens: Clear Ribbed

RESULTS

BENCHMARK: POWER CONSUMPTION AT SAME LIGHTING LEVELS

<table>
<thead>
<tr>
<th>Model</th>
<th>Quantity</th>
<th>Wattage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hosedown Series 2.0</td>
<td>77 (12+65)</td>
<td>6,757 W</td>
</tr>
<tr>
<td>Fluor 4L T5HO 54W</td>
<td>78</td>
<td>18,720 W</td>
</tr>
</tbody>
</table>

86,000 sq.ft. Cold Storage Floor Plan

SPACE CHARACTERISTICS
Size: 86,000 sq.ft.
Reflectivity:
- Ceiling 65%
- Wall 50%
- Floor 20%
Ceiling Height: 25’
Fixture Mounting: 23’
Racking Height: 22’
Aisle Size: ~25’

64% energy savings

25 fc avg. in OPEN AREAS
2.00:1 uniformity

15 fc avg. in the RACKS
2.78:1 uniformity

+177%
Meeting USDA Lighting Requirements

§416.2(c) Light: Lighting of good quality and sufficient intensity to ensure that sanitary conditions are maintained and that product is not adulterated must be provided in areas where food is processed, handled, stored, or examined; where equipment and utensils are cleaned; and in hand-washing areas, dressing and locker rooms, and toilets.
The Importance of Proper Lighting

Improved Product Quality
Grading, sorting and inspection tasks involve recognizing shapes, surfaces, and colors in order to successfully compare samples and find defects or imperfections. Optimal light levels with good uniformity and high color rendering are required to discern those important details and avoid costly errors.

Safer Machine Operation
Some tasks involve the use of sharp utensils such as knives, grinders and slicing machines; high light levels with low glare and adequate uniformity are required to prevent accidents. Flicker-free light sources prevent the hazardous stroboscopic effect that happens when rotating objects appear to be standing still or moving at slow speeds, seemingly safe to touch, but in reality move at much higher speeds which can cause severe injuries.

Accident Prevention
In freezer areas, walking or driving forklift trucks in wet or icy conditions represent a high risk if employees cannot see the floor properly due to inadequate lighting.

Higher Productivity
When optimal illuminance levels are met, workers experience better visibility and higher concentration, increasing their accuracy and work speed.

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>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FOOD PROCESSING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>5</td>
<td>5</td>
<td>5:1</td>
</tr>
<tr>
<td>Canning (continuous belt)</td>
<td>75</td>
<td>75</td>
<td>3:1</td>
</tr>
<tr>
<td>Wrapping / Packing</td>
<td>30</td>
<td>30</td>
<td>3:1</td>
</tr>
<tr>
<td>Grading / Sorting</td>
<td>75</td>
<td>75</td>
<td>3:1</td>
</tr>
<tr>
<td>Inspection</td>
<td>150</td>
<td>150</td>
<td>3:1</td>
</tr>
<tr>
<td><strong>BEVERAGE PROCESSING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filling Bottles and Cans</td>
<td>30</td>
<td>30</td>
<td>3:1</td>
</tr>
<tr>
<td>Keg Washing / Boiling</td>
<td>30</td>
<td>30</td>
<td>3:1</td>
</tr>
<tr>
<td>Dairy: Boiler Room</td>
<td>30</td>
<td>7.5</td>
<td>3:1</td>
</tr>
<tr>
<td>Dairy: Bottle Sorting</td>
<td>75</td>
<td>75</td>
<td>3:1</td>
</tr>
<tr>
<td>Pasteurizers</td>
<td>30</td>
<td>30</td>
<td>3:1</td>
</tr>
<tr>
<td><strong>MEAT &amp; POULTRY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slaughtering</td>
<td>30</td>
<td>30</td>
<td>3:1</td>
</tr>
<tr>
<td>Cleaning / Cutting / Cooking / Grinding</td>
<td>30</td>
<td>30</td>
<td>3:1</td>
</tr>
<tr>
<td>Chicken Sexing</td>
<td>500</td>
<td>500</td>
<td>3:1</td>
</tr>
<tr>
<td>Egg Quality Inspection</td>
<td>75</td>
<td>75</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 in storage influence the quality of lighting as well.
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.