

FOOD PROCESSING

FEARLESS

LIGHTING FOR
FOOD PROCESSING
FACILITIES
BEST PRACTICES

FOOD PROCESSING CHARACTERISTICS

Food processing environments present a unique set of challenges to the performance and durability of lighting equipment. A food processing facility typically includes many different areas, each of which demands a lighting solution that meets its specific environmental and illumination needs.

A typical food processing facility consists of a number of distinct areas:

- NSF classified areas: Food Zone, Splash Zone and Non-Food Zone
- Warehousing, staging, distribution areas including cold storage and non-conditioned storage areas
- Some of the above areas may be classified as hazardous locations
- General indoor and outdoor areas: offices, lobbies, corridors, loading docks and parking lots.

Acuity Brands Lighting's extensive offering of lighting equipment not only meets the luminaire construction requirements set forth by the USDA, FDA and NSF, but also delivers superior optical performance and allows fewer luminaires or lower wattage than commonly required.

CHALLENGES OF FOOD PROCESSING ENVIRONMENTS

The main challenge is that luminaires must be able to withstand the daily wash downs required to prevent bacteria growth or harborage of other contaminants, and must be able to endure the corrosive effects of cleaning solutions. And because some areas of a processing facility are often refrigerated, luminaires must be able to turn on and deliver the appropriate light levels at sub-zero temperatures.



Splash-Zone



Non-Food Zone



Hazardous



Cold Storage



Non-Conditioned Storage

CONDITIONS OFTEN FOUND IN FOOD PROCESSING ENVIRONMENTS:

- grease
- oil
- smoke
- dust
- steam
- high-pressure wash down
- extreme temperatures

FOOD PROCESSING



STANDARDS AND REGULATORY BODIES

NSF INTERNATIONAL (NSF) is a not-for-profit, independent, third party certifier of products and systems for conformity with consensus and official regulations and specifications, industry standards and product specific test protocols.

In order to determine its suitability for use in food processing and handling areas, the equipment and the manufacturer must pass a stringent series of tests. NSF performs all tests in its own laboratories and performs unannounced inspections and audits to ensure ongoing conformance.

As required by the sanitation program of the food processing process, high-pressure wash down with hot water and/or sanitation chemicals may approach 1000 psi nozzle pressure. Lighting fixtures must be designed and manufactured so as not to leak, corrode, harbor bacteria, or cause fires or electrical problems. Lamps must be contained so that if they break, glass or other materials shall not contaminate the food production area.

NSF defines three categories of certifiable locations for sanitation requirements of equipment, addressing the handling, preparation, inspection and storing of food or beverages, as classified in the following NSF table. Only the first two categories are applicable to lighting fixtures.



CHALLENGES

NSF CERTIFICATION	Description Of Location / Use and Commentary	Typical Lighting Applications
NON-FOOD ZONE	Areas where direct contact with food products during normal operations would not be expected. Equipment is located outside the normal washdown area. There is a concern that the fixture will add contamination to the protected space or food product (i.e. cleanability - will the finish withstand cleaning, chipping paint deteriorating paints or finishes, lens impact resistance, lamp glass breakage, etc.).	Kitchens; Food storage; Dry process areas; Damp process areas - no drip possibility.
SPLASH ZONE	Areas where direct contact with food products during normal operations would not be expected; however, the fixture may be situated such that liquids used in the processing or cleaning procedures, may splash, spill, or otherwise soil - either intentionally or inadvertently - the surface of the fixture. There then is the potential for dripping or draining onto other surfaces or even the process. Since these fixtures are often used in washdown areas, a Wet-Location listing is not sufficient. Fixtures must be tested to withstand high-pressure hose washdown. The concerns of Non-Food Zone also apply.	Wet or damp process areas; High Pressure purging or decontamination used in the process; Area using hose washdown.
FOOD ZONE	Areas where direct contact with food products is normally expected and surfaces from which the food may drip, drain, or splash back onto surfaces normally in contact with food. Equipment other than lighting fixtures typically requires this certification (i.e. work tables, cutting boards, other direct contact equipment).	Category not typically used for lighting.

Holophane's Vantage® fixtures: no crevices or recesses in which bacteria and mold could thrive, surfaces constructed of non-toxic material, all openings sealed and gasketed.

NSF public health officials and other regulatory agencies recognize NSF's formally registered trademarks.

NEC HAZARDOUS STANDARDS

Some food processing facilities, especially grain processing plants, may have areas where chemicals or dust may be used or produced and, given the correct catalyst, will set off a violent explosion. The (US) National Electrical Code (NEC) identifies and classifies potentially hazardous materials and conditions by Class, Division and Group. Hazardous areas within a food processing facility typically fall under Class II, Division 1 or 2 and Group G. It is the responsibility of the local building or electrical inspector or the facility's insurance underwriter to classify an area as 'hazardous' in accordance with the NEC definitions. Additionally, the NEC specifically requires that electrical equipment installed in a hazardous area be approved for use in that area by an impartial third party (e.g., UL-Underwriters Laboratories, FM-Factory Mutual, CSA-Canadian Standards Association, etc.).



Note: the NSF, NEC, IESNA and USDA classifications, definitions, recommendations and requirements described in these pages are adopted in the United States. Acuity Brands Lighting products are designed to meet or exceed these requirements. These requirements, however, may or may not be adopted in your country or locality. Please refer to your local food processing industry lighting and lighting equipment requirements and determine suitability of specific products with respect to specific applications. Please consult your local Acuity Brands Lighting representative for further advice.

IESNA RECOMMENDATIONS

The Illuminating Engineering Society of North America (IESNA) has developed recommendations for lighting common environments and tasks within the food processing industry. The IESNA recommended illuminance and uniformity levels are listed below:

RECOMMENDATIONS FOR INTERIOR LIGHTING (AVERAGE MAINTAINED LUX)		
TASK	ILLUMINANCE HORIZONTAL	UNIFORMITY (MAX: MIN)
General Food & Beverage Manufacturing		
Loading Areas	100-200	10:1
Boiler Rooms	50-100	3:1
Food Storage	50	5:1
Control Areas	50-100	3:1
Catwalks and Platforms	20-50	4:1
Corridors	100-300	5:1
Food & Beverage Processing		
Raw Material Processing	100-1000	3:1
Wrapping, packaging, labeling	50-300	10:1
Warehousing, Staging	300	10:1
Inspection	300-10000	3:1
Grading and Sorting	750-1500	3:1
Boiling and Keg Washing	300	10:1
Color Grading	1500	3:1
Canning	750	3:1
Bottling	300-750	3:1
Maintenance	500	3:1
Meat and Dairy		
Slaughtering	300	10:1
Cleaning, cutting, cooking, grinding	300	10:1
Gauges, meter panels, thermometers	750	3:1
Pasteurizers	300	10:1
Vats and Tanks	150-750	3:1
Feed Storage	30-70	5:1
Milking Operations	150-300	5:1
Milk handling	150-750	3:1
Flour Mills		
Rolling, sifting, purifying	750	3:1
Packing	300	10:1
Product Control	150	3:1
Poultry		
Brooding, hatcheries	150	10:1
Egg processing, handling, packing, shipping	750	3:1
Fowl processing	750	3:1
Feed storage	150-300	5:1
Office Areas		
Meeting Rooms	300-1000	3:1
Ramps and Stairs	100-300	10:1
Offices	300-800	3:1
Building Entrances/Lobby	30-300	20:1
Restrooms	300	10:1
Emergency	5-50	10:1

USDA REQUIREMENTS

In addition to IESNA lighting recommendations, the United States Department of Agriculture (USDA) establishes minimum lighting requirements within and around a food processing facility. The following table summarizes the USDA minimum lighting requirements for meat and poultry packing plants:

USDA MINIMUM LIGHTING REQUIREMENTS (AVERAGE MAINTAINED LUX)		
TASK	MEAT	POULTRY
General	300	300
Offal Cooler	300	X
Carcass Coolers	300	X
Freezers	300	X
Dry Storage	300	X
Ante-mortem Inspection	300	300
Suspect pen Inspection	500	X
Inspection Stations	500	X
Inspection Stations (Traditional)	X	500
Inspection Stations (NELS/SIS/NTI)	X	2000
Pre and Post chill Inspection	X	2000
Establishment Quality Control Inspection	500	2000
Reconditioning and Reinspection	300	2000
All other Areas	300	300

LIGHTING CONSIDERATIONS

ILLUMINATION LEVEL AND UNIFORMITY

High levels of illumination are often required in food processing facilities to allow workers to operate equipment, read gauges or monitors, perform speed sensitive tasks or discern colors. Food processing facilities may have pipes and lines near the ceiling that block light and keep it from reaching critical pieces of equipment. Lighting uniformity is essential for good visibility; it allows workers on the floor to see other workers and details of materials, products and equipment without the hindrances of shadows and glare. In a uniformly lighted facility, workers can see product as it travels anywhere in the space and can see visual cues across the room and still have plenty of light to perform their specific tasks in a safe, efficient and productive manner.



COLORS AND COLOR RENDERING

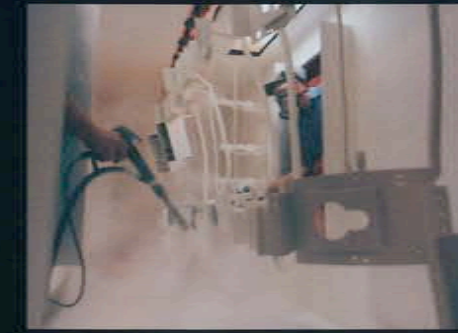
The ability to accurately determine the exact color of an object is especially important in food processing facilities. The use of color requires lamps to render the true colors of the objects. Color rendering is the ability of a light source to represent the true colors of an object. The closer the color rendering index (CRI) is to 100, the more natural the colors will appear. Color is a wonderful tool to enhance sanitation, sort various grades of products, minimize the potential of contamination, dispose of waste and make cleaning more efficient and effective. Many food processing plants are now using white walls and ceilings rather than bare metal, as white surfaces usually have less glare and provide greater vertical illuminance, helping to keep work areas bright. Studies show that people (including inspectors) associate white with cleanliness. In fact, a white processing environment may subconsciously remind the workforce to keep the area clean.



VERTICAL ILLUMINATION

Vertical illumination is the light that falls upon vertical surfaces such as display panels on a machine, labels on a storage rack, signs on a wall, or products traveling on hanging conveyors. Horizontal illumination is the light that shines on horizontal surfaces such as products

traveling on rolling conveyors, aisles in a warehouse and tabletops in a processing area. A quality lighting system will provide sufficient levels of vertical and horizontal illumination. Generally, the vertical illumination level should be half that of the horizontal level. For example, if an inspection area is designed for horizontal 1000 lux, the minimum vertical illumination should measure 500 lux.



DURABILITY AND MAINTENANCE

A quality lighting system constructed of high performance materials will last longer and require less maintenance. Design features such as interchangeable parts, a quick disconnect and hinged door assembly will simplify maintenance and reduce time required for repair and lamp replacement. In applications where glass is allowed, glass, especially Holophane's glass optical systems, never becomes discolored and will not attract dust and dirt, which reduces cleaning requirements. Low copper aluminum alloys used in fixture housings are corrosion resistant and meet UL requirements for marine type environments - making the luminaires particularly suitable for areas where salt or other chemicals present a maintenance challenge. All Acuity Brands Lighting products intended for food processing applications are finished with polyester powder paints. A five, and with some products, seven stage pre-treatment process assures proper paint adhesion and allows finishes to meet or exceed all applicable American Society for Tests and Measurements (ASTM) requirements.



SPECIAL CEILINGS

Ceilings and equipment mounted in or on the ceiling surface within a food processing plant can be a source of contamination; therefore, ceilings are often designed and constructed to prevent adulteration of food products physically, chemically or microbiologically, as to render food products unsafe for consumption. A great deal of time is spent washing and sanitizing ceilings and their accompanying lighting fixtures; it is therefore necessary for these fixtures to be water proof and capable of performing in wet and damp environments while maintaining the design integrity of the ceiling itself. Ceilings in food processing facilities are also used as a thermal barrier in cold storage areas, in blast freezers or in high temperature environments to minimize heat transfer, and are subject to extreme expansion and contraction, especially when washed down with hot water. Walk-on suspended ceiling systems allow maintenance of services above ceiling while production continues below in a bright, sanitary and hygienic environment. These extreme conditions require ceilings to be made thicker and with different materials than a typical ceiling. Consequently, luminaires must be specifically designed to not only withstand the rigors of frequent washing and cleaning but also to maintain structural integrity and water resistance between the luminaire and the ceiling.

PRODUCT PORTFOLIO FOR THE MODERN FOOD PROCESSING FACILITY

SPLASH ZONE



Holophane Vantage® RTT

- 100W to 400W
- Heavy gauge aluminum housing
- Miro® 4 optical assembly
- Stainless steel door frame
- Top access to lamp and ballast
- 500 psi wash down rated
- NSF International Splash-Zone rated



Holophane Vantage® VA/VK/MINI

- 70W to 400W
- High temperature acrylic optics
- Bottom access door
- 3500 psi wash down rating
- NSF International Splash Zone rated



Lithonia TXF®

- 175W to 450W
- FDA/USDA compliant
- IP65 rated
- 1200 psi wash down rated
- NSF International Splash-Zone rated

Lithonia FHE®

- 32W T8; 28W T5; 54W T5HO
- Enclosed and gasketed fiberglass
- IP65, IP66, IP67 rated
- 1300 psi wash down rated
- NEMA 4X rated for wet-location use
- NSF International Splash-Zone rated



Lithonia EFS®

- 28W T5; 32W T8; 54W T5HO
- Surface or suspended-mount, for task illumination, < 5m ceilings
- IP65 rated
- FDA/USDA Compliant
- NSF International Splash-Zone rated



SPLASH ZONE

Lithonia DMW®

- 32W to 110W; T8, T8HO, slimline; 48", 96"
- Ideal for refrigerated areas and food processing environments
- IP65 rated
- NSF International Splash Zone rated



Lithonia FHH®

- 32W T8; 28W T5; 54W T5HO
- Aluminum High Bay
- IP55 rated
- 1300 psi wash down rated
- NSF International Splash-Zone rated



Lithonia EFT®

- 32W to 110W; T8, T8HO; 48", 96"
- Designed for ease of cleanability in hose-down conditions
- IP65 rated
- FDA/USDA compliant
- NSF International Splash-Zone rated



Lithonia Indura® 4X

- Provides a minimum of 90 minutes of illumination for the rated wattage upon loss of AC power.
- IP65 rated
- NEMA 4X rated for wet location use
- NSF International Splash-Zone rated

NON-FOOD ZONE

Holophane Vantage® ALT

- 250W to 400W
- Die cast aluminum housing
- High temperature acrylic optics
- Bottom access door
- Optional integral upright component
- NSF International Non-Food Zone rated



HAZARDOUS LOCATIONS



- ### Holophane Vantage® VH
- 250W to 400W
 - Die Cast Aluminum housing
 - High temperature acrylic optics
 - Bottom access door
 - CII D2 Hazardous location rating



Holophane Petrolux® III

- 50W to 400W
- Choice of photometric distributions
- Thermal shock resistant glass refractors
- Variety of mounting methods
- Small and Large housing sizes
- CI D2, CII D1+2, CIII Hazardous location rating



Holophane DeSoto® HRE (DSHRE)

- Copper free cast aluminum enclosure
- Multiple mounting configurations
- Acrylic face with 6" lettering
- CI D1 Hazardous location rating



Holophane Predator®

- 50W to 400W
- Corrosion resistant housings
- Stainless steel exposed hardware
- Narrow, wide and spot distributions
- CI D2, CII D1 and CIII D1 Hazardous location rating



Lithonia HFA® / HFR® / HFM®

- 100W to 400W
- NEMA heavy-duty constructed housing
- UL listed for marine outside locations
- IP65 rated
- CI D2 hazardous location rating



COLD STORAGE



Holophane Enduralume®

- 175W to 400W
- Thermal shock resistant optics
- Corrosion resistant paint
- Acrylic prismatic glass lens
- Optional integral upright component
- -40°C starting temperature



Holophane Lobay® V

- 175W to 400W
- Choice of square distribution or Refractive Grid® lens
- Optional Wet location rating
- -40°C starting temperature



Lithonia FFB®

- 32W T8, 54W T5HO
- May be mounted at heights of 4 to 12 meters
- Provides significant reduction in energy consumption, compared to common HID luminaires
- -29°C starting temperature



Lithonia Extreme®

- Operable down to -40°C (optional)
- Optional NEMA 4X listing
- Ideal for high abuse, hose-down and wet location applications



Lithonia Indura®

- 18W to 450W; Provides a minimum of 90 minutes of illumination for the rated wattage upon loss of AC power
- Vertical orientation designed especially for pole or column mounting. Also suitable for wall, I-beam, ceiling and pendant mounting
- Listed down to -40°C (optional)

NON-CONDITIONED STORAGE



- Holophane Primalume® Enclosed**
- 150W to 1000W
 - Patented ISD SuperGlass® optics
 - Excellent vertical illumination
 - Factory set photometric distributions
 - UL/CUL listed 65°C, damp location



- Lithonia TH® High Bay**
- 175W to 1000W, pulse start options
 - Aluminum reflector
 - Adjustable mounting bracket



- Holophane Prismpack® V Enclosed**
- 150W to 1000W
 - Patented ISD SuperGlass® reflectors
 - Two different housing sizes
 - Excellent energy efficient horizontal illumination
 - UL/CUL listed 65°C, damp location



- Lithonia I-BEAM®**
- 4 or 6 54W T5HO lamps
 - T5HO Cool Running™ Technology
 - 5 yr warranty at 55°C and 3 yr warranty at 65°C, ambient temperature
 - 95% reflective Miro 4® reflector
 - Ballast access from below, easy for service
 - Options include motion sensor and Reloc® flexible wiring. Can be used with Synergy® Lighting Controls (Check with your local sales representatives for voltage offerings)
 - Suitable for most manufacturing and warehouse applications



- Holophane RE® Luminaire**
- 250W to 400W
 - Encapsulated ballast, quiet operation
 - Patented ISD SuperGlass® optics
 - Uncovered & covered glass reflectors
 - UL listed 55°C, damp location listed
 - Ideal for light industrial & warehouse applications



- Lithonia MS5HB®**
- 2, 3, 4 or 6 54W T5HO lamps
 - 2 or 3 lamp cross sections, 4 or 6 lamp options available in 8' length tandem units
 - 95% reflective Miro 4® reflector, with narrow distribution
 - Optional straight blade louver shields lamps and reduces glare
 - Options include Reloc® flexible wiring and integration with Synergy® Lighting Controls (Check with your local sales representatives for voltage offerings)
 - Suitable for aisles and open spaces in warehouse and light industrial applications, and where glare shield is required.



FOOD
PRO-
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ING

Properly lighting food processing facilities can present a unique set of challenges. Tough environments and stringent sanitation requirements as well as productivity, safety, energy efficiency and maintenance considerations must all be taken into account. With a complete line of products designed for food processing applications, expert international local representatives and unparalleled customer service, Acuity Brands Lighting provides the best lighting solutions and practical assistance for meeting food processing codes and regulations, delivering quality lighting appropriate for the tasks and processes in the facility while achieving optimal operating cost efficiency.

AcuityBrands
Lighting



Providing the industry's broadest line of commercial, industrial, institutional and residential fixtures.



A leader in outdoor and industrial lighting solutions for over 110 years.



Produces a wide range of lighting control systems, suitable for applications in high-rise office buildings, multi-building complexes, manufacturing plants and sports facilities.



Reloc wiring solutions offers plug-in, relocatable components suitable for wiring commercial and industrial lighting fixtures. Reloc modular wiring offers significant benefits over conventional hardwiring, with reductions in installation and labor time as well as easy fixture relocation.

