LED Food Processing Luminaires

Sealed Enclosure Lighting Designed to Reduce Contamination

Food Processing Luminaires

FP

A brand of legrand®

KENALL®

Kenall Food Processing

Luminaires Built To Keep the Food Processing Environment Clean and Productive

Food Processing applications require sealed enclosure luminaires certified to IP and NSF standards to reduce the risk of contamination and to avoid costly disruption of work due to unscheduled maintenance. For over 50 years Kenall has provide optimized solutions for demanding lighting applications by meeting the needs of the space. Through the use of market research and continuous product development, Kenall has become the leading authority in sealed enclosure luminaires. Our expertise and concern for the unique needs of food manufacturers led us to develop a comprehensive product portfolio for all food processing applications.

Because food manufacturing and processing facilities must meet stringent inspection standards, Kenall's sealed enclosure luminaires support critical sanitation protocols, which are imperative to reducing the risk of contamination. A well-designed sealed enclosure utilizing high-quality construction and materials virtually eliminates the risk of contamination and need for unnecessary maintenance. Our luminaires offer a non-porous, triple-gasketed sealed design that ensures they remain free of corrosion, dust, dirt, insects, moisture and bacteria. The sealed luminaire design also helps reduce costly unscheduled maintenance and downtime by protecting the luminaire's internal components.

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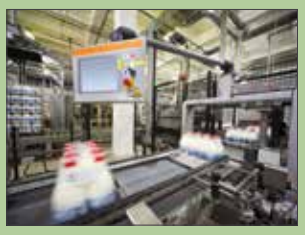


Packaged Goods

Cold Storage/Freezers

Commercial Bakeries

Dairy Processing

Kenall Lighting Addresses the Needs of Food Processing Environments

Cleanability

Maintaining sterile food processing environments requires frequent cleaning, the use of harsh cleaning agents and even complete hosedown. Kenall's luminaires adhere to the standards of cleanability for sanitary environments established by the National Sanitation Foundation (NSF).

Sealed

To protect against contamination, the luminaire must not allow penetration of airborne particulates or waterborne pathogens. To assure the luminaires are truly dustproof and watertight, Kenall's luminaires have ingress protection ratings and are P442 listed.

Illumination

Food processing environments require the correct amount of illumination at each task location. Those levels are established by the USDA, FDA, and IES. Kenall offers a wide range of lumen packages suited to these environments.

Color Rendering

Accurate color rendering is essential during the processing and inspection of food products. For this reason, most Kenall LED luminaires have a minimum Color Rendering Index (CRI) of 80.

Maintenance, Serviceability

Luminaire cleaning and maintenance must be performed when manufacturing lines below are shut down, reducing plant productivity. For this reason, many of our fixtures feature top access, captive hardware, tool-less access or other time saving design elements.

Lighting With a Purpose

From cold storage to the production line the lighting in a food processing environment has a specific purpose with unique requirements. Kenall's sealed enclosure luminaires have been designed with those requirements in mind.

EnviroPro™ TekDek™
EPTD Series

- Marine-grade die-cast aluminum housing resists corrosion and condensation
- Embedded microwave motion control system designed to perform in low temperatures is available
- Wide distribution provides excellent visibility in coolers and freezer
- IP65 rated for ingress protection against dirt and moisture
- NSF2 listed for cleanability

EnviroPro™ Low Bay
EPLB Series

- Pendant mounting for easy installation
- Great for cold storage, process and dock areas
- IP65 rated for protection against dirt and moisture
- NSF2 listed for cleanability

Metrex™
CMEX Series

- NSF2 listed and durably sealed for wash-down cleaning
- Recessed with smooth surfaces
- Self-test circuitry with remote laser activated test switch
- IP65 rated for ingress protection against dirt and moisture

EnviroSeal™ Linear Wraparound
FES Series

- Standard wet location with optional IP65 rating
- Many sizes to fit your application
- Flush surface mounting allows seal at perimeter
- NSF2 splash / non-food zone

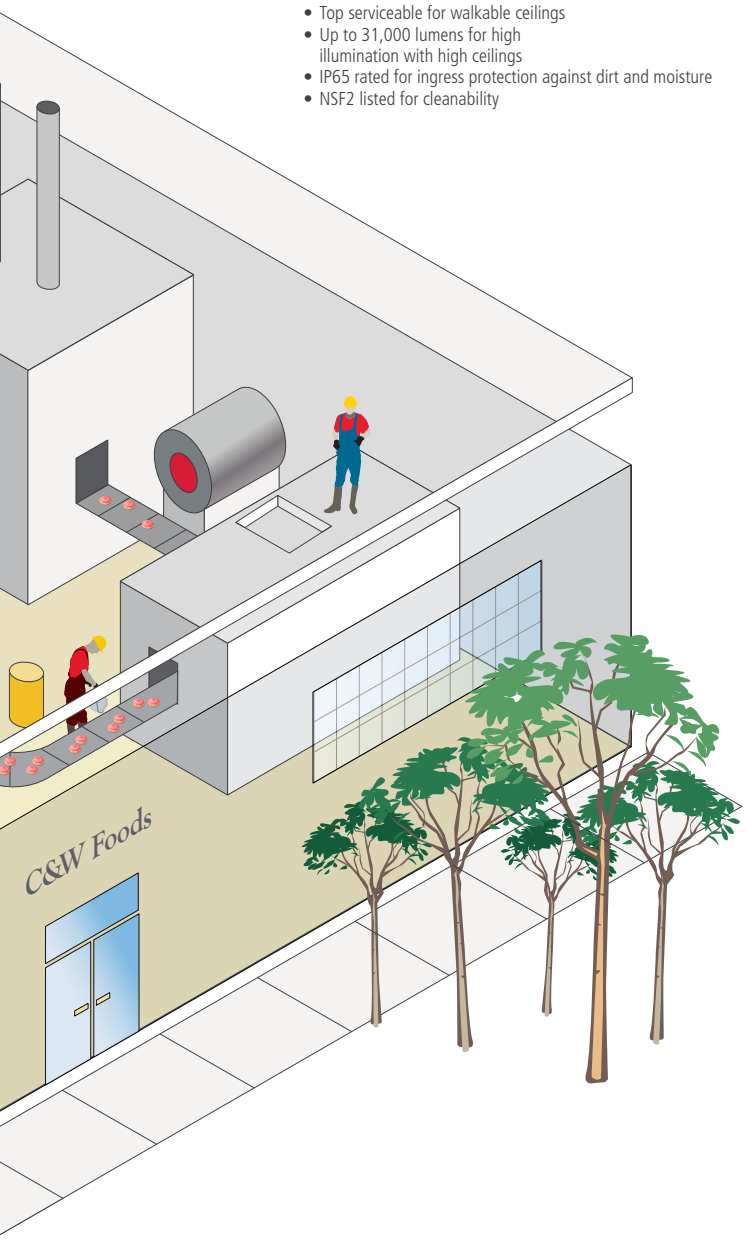
NEW

EnviroPro™ Top Access
EPFRO22 Series

- Top serviceable for walkable ceilings
- Up to 31,000 lumens for high illumination with high ceilings
- IP65 rated for ingress protection against dirt and moisture
- NSF2 listed for cleanability

SimpleSeal™ Top Access
CSEFRO Series

- Top service-able for walkable ceilings
- No room-side fasteners
- Simple access to lamp compartment
- IP65 rated for ingress protection against dirt and moisture
- NSF2 listed for cleanability



Simple Seal™ CSEDO Series

- Designed for a wide variety of food processing areas
- P442 protocol
- Resistance to high humidity and washdown
- Corrosion resistant
- IP66 and NSF2 Listed for Food Zone

EnviroPro™ EPC Series

- Ready for extreme environments
- Ratings include IP65, NEMA 4X and NSF2 Food Zone
- Easy pendant mounting without opening the fixture
- Curved surfaces that resist accumulation of debris and water

Lighting that Meets Food Processing Requirements

		Applications							
		Industrial Food Process (Sterile Packaged Foods)	Dairy Processing	Meat Processing	Institutional Kitchen (School, Hospital, etc)	Commercial Kitches (Restaurants)	Freezer (Walk-in)	Cold Storage	Bakery (Industrial or commericial)
Conditions	Water Resistance: Steam/ Condensation	X	X				X	X	
	Water Resistance: Daily Washdowns		X	X					
	Water Resistance: Frequent Washdowns	X							
	Water Resistance: Infrequent Washdowns						X		
	Water Resistance: No Washdowns expected				X	X		X	X
	Physical: Impact damage						X		
	Physical: High Ambient	X				X			X
	Physical: Low Ambient	X	X						
	Physical: Sub Zero Ambient		X	X			X	X	
	Listings/Certifications: NSF Food or Splash Zone	X	X	X					
	Listings/Certifications: NSF Non-Food Zones				X	X	X	X	X
	Listings/Certifications: Wet Locations	X	X	X	X	X	X		
	Listings/Certifications: Cleanroom Classified	X							
	Listings/Certifications: IP-65	X	X	X			X	X	X
	State/Local inspections	X				X	X	X	X
	USDA/FDA		X	X					
Luminaire Type									
	Typical Fixtures (Model Series)	CSEDO CSEFRO EPFRO FES	CSEDO EPC EPFRO EPLB	CSEDO EPC EPFRO EPLB	CSEDI CSEDO FES	CSEDI CSEDO FES	CSESO EPTD17 FES	EPLB EPTD17 FES	CSEDO CSEFRO EPFRO

Kenall's Sealed Enclosure Lighting – Designed for New NSF Protocols

Kenall has spent decades perfecting sealed enclosure lighting: prior to new protocols created by NSF International, we developed our own rigorous pressure-testing protocol, called K230, to ensure that the SimpleSeal™ luminaires are built to prevent both the ingress and egress of dust, fungus, bacteria and other contaminants that might put processes and people at risk.

Now, NSF has introduced a new protocol very similar to K230 – called **NSF P442**. It requires stringent pressure testing and third party certification to prove that luminaires are qualified for clean industrial applications: they must prevent the flow of air between the plenum space and the controlled environment, be protected from contaminants, particulates and moisture, and be easily cleanable. This protocol is very difficult to achieve, but proves that a luminaire is truly leak-proof and ready for use in the most challenging environments.

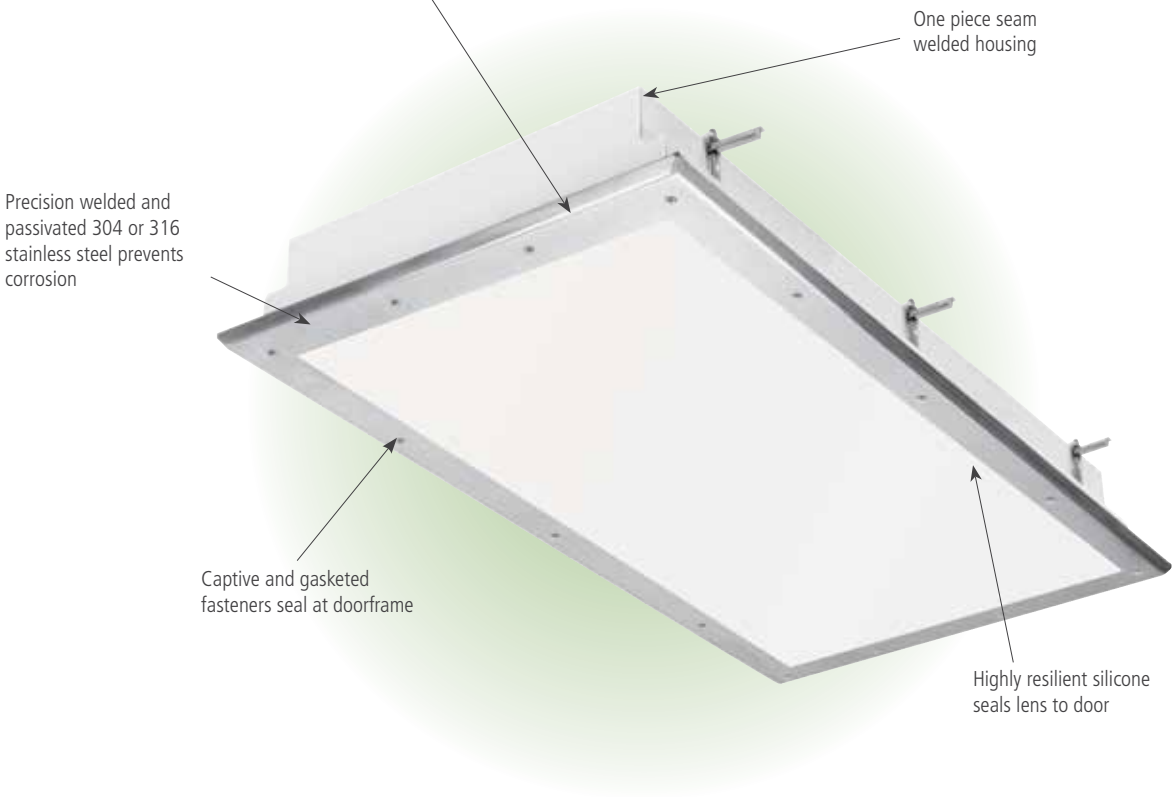
Not every situation demands this protocol – but for those that do, look for the **NSF P442** certification, like the one you'll find on our SimpleSeal CSEDO series. These luminaires have a patented, triple-gasket design that seals the fixture three ways: lens to door, door to housing and housing to structure. For more information about this luminaire series, see page 12.

NSF Protocol P442
Controlled Environment Light Fixture

Patented* doorframe design compresses the perimeter gasket, assuring consistent seal at housing and ceiling. The force of the screw is redirected to outer perimeter gasket.

*Patent #US5902035

Section View



LED

EnviroPro™ Top Access Luminaire Series

NEW

The EnviroPro™ Top Access (EPFRO Series) LED luminaire is designed to be installed in walkable ceilings, allowing ready access from the plenum rather than from the manufacturing floor. This top access prevents the need to interrupt production lines or compromise the luminaire seal. The fixture is designed specifically for the insulated metal panel (IMP) ceiling type that is common to food processing areas. Unique thermal management using multiple heat sinks assures that the heat created by the luminaire remains outside the temperature controlled space, helping reduce energy consumption.

Features

- Reduced luminaire size maintains ceiling panel integrity
- Designed to resist damage by accidental foot traffic*
- LED Lumen packages from 21,000 lm
- Integral emergency battery pack available
- Designed specifically for IMP ceilings
- Tool-less entry via stainless steel latches
- Stainless steel 60° beveled edge trim provides tolerance for ceiling cutout
- Up to 6" ceiling thickness (Consult factory for ceilings over 6" thick)

* Not intended for walking traffic

Performance Features

Doorframe fully sealed to housing with a closed-cell gasket to prevent leakage from the plenum into fixture.

Performance Chart

Lamp Type	Delivered Lumens (lm)	Input Power (W)	Efficacy (lm/W)
192L40K7	23,515	213W	110 lm/W
295L40K7	31,557	325W	97 lm/W

Lumen data based on Type 5N-DTA performance.
See specification sheet for other options and performance.

LOCATION: Lyons, GA
DETAILS: U.S. Pet Nutrition
Read the entire case study at www.kenall.com/Literature/Case-Studies.html

LED

EnviroPro™ High/Low Bay Luminaire Series

The EPLB Series combines durable construction and high performance optics - including a prismatic acrylic lens with optional spun reflector or faceted refractor - for optimal light distribution and maximum photometric performance. The EPLB series is available in three sizes to accommodate various ceiling heights.

Features

- Available in 12", 16" and 22" diameters
- Lumen packages from 2,025 – 25,370 lm
- Servicable, high-efficacy, high-CRI LED arrays
- Corrosion-resistant, smooth exterior finish
- Choice of refractor or reflector: clear prismatic acrylic, polycarbonate, spun aluminum or pearlescent prismatic acrylic
- Embedded TekLink microwave occupancy sensor technology optional
- ETL/CETL Wet Location listed (enclosed model)
- ETL Classified IP65 per IEC 60598 (enclosed model)

IP65 NSF

Type (E) only

Performance Data

Reflector Size	Lamp Code	Delivered Lumens (lm)					Efficacy (lm/W)	Input Power (W)	Est. L70 LED Life (Hrs)
		35K8	40K7	40K8	50K7	57K7			
12	17L	2,009	2241	2099	2,247	2,817	93-130	21.6	60,000
16	94L	11,330	12,638	11,839	12,670	13,629	107-129	106	125,000
	144L	16,106	17,966	16,830	18,011	18,969	102-120	158	125,000
	192L	20,513	24,273	23,084	24,622	24,851	98-118	210	105,000
22	92L	10,934	12,197	11,426	12,227	13,913	104-133	105	150,000
	144L	16,342	18,229	17,077	18,275	19,365	103-122	159	125,000
	192L	21,466	23,945	22,431	25,602	25,370	103-121	209	105,000

Displayed information above is valid for the type 'E' enclosure and the type 'CA' lens. Lumen output values for alternate constructions are available upon request. Visit www.kenall.com for .ies files and additional information.

Performance Features

Smooth, rounded housing sheds water and resists corrosion, making it ideal for hosedown areas.

Choose from three reflector types to accommodate various lighting requirements.

Sealed lamp access and cord assembly protect against water ingress.

Choice of rigid pendant or loop hanger with quick disconnect. Safety chain available with loop hanger.

Continuously-sealed lens facilitates rigorous cleaning and protects against contaminant entry.

LED

The SimpleSeal™ Overlapping Door Luminaire

The SimpleSeal™ Overlapping Door (CSE_O Series) is composed of a one-piece, seam-welded, hole-free housing; a one-piece doorframe and a one-piece doorframe-to-housing gasket. These easy-to-clean fixtures meet IP66 Ingress Protection and pressurized plenum standards and the doorframe's patented fulcrum repositioning bracket provides even, positive securement to the ceiling surface. This series is ideal for use anywhere within the facility, including general processing areas, commercial kitchens, packaging areas, storage facilities, corridors, and research & development.

Features

- Surface, grid, flange or corner mount installations
- Available in 1'×4', 2'×2' and 2'×4'
- Available in T5, T5HO and T8 lamp options (see website for information)
- LED lumen packages from 4,358 – 22,392 lm
- Servicable high efficacy high CRI LED arrays
- One-piece, seam-welded housing in cold-rolled steel, painted aluminum, or stainless steel
- Available with clear or prismatic acrylic, polycarbonate, or tempered glass lens

CSESO Series

IP65 | NSF | ISO 5 Class 100 | FN (Option)

CSEDO Series

ETL | IP66 | ISO 5 Class 100 | CCEA Approved | FN | NSF Protocol P442 Controlled Environment Light Fixture

Performance Features

Patented fulcrum repositioning bracket provides reverse doorframe bowing to assure consistent contact with ceiling surface. Doorframe and gasket mate to ceiling structure, eliminating the need for caulk.

Flush mounted, captive, stainless steel fasteners with Teflon® bushings ensure air-tight integrity of the fixture and ease of cleanability.

The doorframe's 60° beveled edge assures protection against harsh cleaning protocols and is easier to clean than a standard 90° return.

Extruded closed-cell gasket with customized shape, continuous skin and vulcanized corners mechanically secured to doorframe for one-piece protection.

Robotically TIG-welded housing assures seal over weaker lapped and spot-welded construction.

Sealed swing-out arms mean that recessed flange housing can be installed in ceilings more quickly and securely than outdated and labor intensive mounting yokes.

Performance Data

Size	Lamp Code	Delivered Lumens (lm)	Efficacy (lm/W)	Input Power (W)	Est. L70 LED Life (Hrs)
1' × 4'	45L40K	4,672	88	50	80,000
	67L40K	6,706	91	74	80,000
	90L40K	9,072	92	99	60,000
2' × 2'	45L40K	4,647	93	50	80,000
	67L40K	6,660	90	74	80,000
	90L40K	9,640	97	99	60,000
2' × 4'	45L40K	5,116	106	48	80,000
	67L40K	7,333	94	73	80,000
	90L40K	9,423	97	98	60,000
	135L40K	14,556	98	148	60,000
	180L40K	21,531	107	199	60,000

Lumen data based on Type 5N-DTA performance. See specification sheet for other options and performance.

LED

The SimpleSeal™ Inset Door Series Luminaire

The Inset Door Series (CSEDI Series) is designed for applications where cleaning protocols are less important, providing an economical alternative for less inclusive performance requirements. This series meets IP65 Ingress Protection and pressurized plenum standards for prevention of particulate contamination and pressure leakage.

The Inset Door series is comprised of a one-piece, seam welded and hole-free housing, a one-piece housing flange, a doorframe in either aluminum, cold-rolled or stainless steel, and a housing-to-doorframe gasket. This clean design provides excellent performance that has been defined, measured to the highest available standards, and certified by an independent testing laboratory.

Features

- Available in 1'× 4', 2'× 2' and 2'× 4'
- Surface, grid, flange or corner mount installations
- LED Lumen packages from: 4,358 – 22,392 lm
- Serviceable high efficacy high CRI LED arrays
- Available in LED, T5, T5HO and T8 lamp options
- One-piece, seam-welded housing in cold-rolled steel, painted aluminum, or stainless steel
- Available with clear or prismatic acrylic, polycarbonate, or tempered glass lens

Performance Features

Robotically TIG welded to eliminate inherent weakness of lapped and spot-welded construction. Available in cold-rolled steel, painted aluminum or stainless steel (304 or 316).

Sealed swing-out arms and recessed flange housing can be installed in ceilings more quickly and securely.

Flush-mounted stainless steel fasteners with Teflon® bushings ensure air-tight integrity of the fixture and provide ease of cleanability.

Doorframe available in cold-rolled steel, aluminum or brushed 304 stainless steel.

Performance Data

Size	Lamp Code	Initial Delivered Lumens (lm)	Efficacy (lm/W)	Input Power (W)	Est. L70 LED Life (Hrs)
1' × 4'	45L40K	4,678	94	50	80,000
	67L40K	6,706	91	74	80,000
	90L40K	9,072	92	99	60,000
2' × 2'	45L40K	4,647	93	50	80,000
	67L40K	6,660	90	74	80,000
	90L40K	9,640	97	99	60,000
2' × 4'	45L40K	5,116	107	48	80,000
	67L40K	7,333	100	73	80,000
	90L40K	9,423	96	98	60,000
	135L40K	14,556	98	148	60,000
	180L40K	21,531	108	199	60,000

Lumen data based on Type 5N-DTA performance. See specification sheet for other options and performance.

The SimpleSeal™ Top Access Series

Like its new LED counterpart featured on page 8, the SimpleSeal™ Top Access (CSEFRO Series) linear fluorescent luminaire is designed to be installed in walkable ceilings, allowing ready access from the plenum, rather than from the manufacturing floor. This top access prevents the need to interrupt the production lines or compromise the luminaire seal.

Features

- Available in 1'× 4', 2'× 2' and 2'× 4'
- One-piece, hole-free, seam-welded, 18 gauge cold-rolled steel housing
- Tool-less entry via stainless steel latches
- Stainless steel 60° beveled edge doorframe without exposed fasteners
- Suitable for use in ISO-5 rated cleanrooms
- NSF2 food zone/non-contact for food processing areas
- Optional integral emergency battery pack available
- ETL Classified IP65 per IEC 60598

c UL us IP65 NSF ISO 5 Class 100 CCEA Approved FN Option

Performance Features

Precision formed, welded and passivated 304 stainless steel with corrosion protection certified by Intertek according to ASTM A967.

Doorframe with 60° beveled edge assures protection against harsh cleaning protocols: easier to clean than a standard 90° return.

Doorframe fully sealed to housing with a closed-cell gasket to prevent leakage from the plenum into fixture.

Tool-less entry for ease of relamping and maintenance.

Continuous piano hinge enables ease of handling and servicing.

Image courtesy of: AES Clean Technology, Inc.

LED

The EnviroSeal™ Linear Wraparound Luminaire Series

Kenall's EnviroSeal™ Linear Wraparound (FES) luminaires create bright spaces and produce higher levels of vertical illuminance. Integral end caps enable continuous row mount, and a simple hub connector option quickly and easily joins luminaires. In addition, the end caps feature a uniquely-designed slide-in-place and lock lens for easy lens installation and service access. These versatile luminaires are perfect for lighting general processing areas, kitchens and walk-in coolers.

Features

- Available in 3", 5", 8"and 12" widths
- Lengths available in 2', 3', 4', and 8'
- LED Lumen packages from 3,900-8,800
- Replaceable high-efficacy high-CRI LED arrays
- One-piece, heavy gauge, seam-welded, cold-rolled steel or brushed 304 stainless steel housing
- Polycarbonate lens
- Also available in fluorescent
- Integral emergency battery pack available
- Optional UL Classified IP65 ceiling mount (not suitable for continuous row mount)
- Embedded microwave occupancy sensor technology available

Performance Data

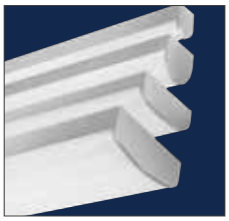
Model	Lamp Code	Delivered Lumens (lm)	Input Power (W)	Efficacy (lm/W)
FES3	45L40K	4,179	50	84
FES5	45L40K	3,938	50	79
	45L40K	4,493	50	90
FES8	67L40K	6,440	74	87
	90L40K	8,230	100	83
	45L40K	4,668	51	91
FES12	67L40K	6,692	74	90
	90L40K	8,551	101	85

Data represents 4000K CCT and 4' length LED luminaires

Performance Features

One-piece housing/end cap is heavy-gauge, seam-welded cold rolled steel. Type 304 or 316 stainless steel housing is available with a Type 4B post-fabricated brushed finish.

High impact extruded polycarbonate lens with internal linear prisms and smooth exterior ensures ease of cleanability.



Available in four profiles to fit many applications.

The high efficacy LED arrays provide superior visability for inspection areas and other places where visual accuity matters.

IP65 option provided with gasketed removable end caps to ensure ingress protection against dust and water.

The pendant mount (PM) option is available for 3" and 5" width luminaires.

Integral end caps enable continuous row mount. A simple hub connector (HC) option quickly and easily joins luminaires.

LED

The EnviroPro™ TekDek™ Luminaire Series

* PEACE OF MIND Guarantee®

IP65

TekDek's EPTD Series combines powerful efficacy with durability for food processing cold storage applications. Kenall's patented, integrated heat sink technology draws heat away from the fixture to maximize LED life, reducing the need for maintenance. Available motion sensing options further enhance cost and energy savings. The specially-designed sealed and gasketed, clear, textured polycarbonate lens reduces glare and provides desirable uplight to enhance vertical illumination.

Features

- 17" diameter
- Lumen packages from 5,000-11,000 lm
- 70CRI or 80CRI
- Marine-grade, die-cast aluminum housing
- Clear textured polycarbonate lens
- Multiple mounting options available
- Peace of Mind Guarantee® with Direct-to-Surface installation
- Up to 150,000 hour life (L70)
- Compatible with TekLink™ controls
- ETL Classified IP65 per IEC 60598

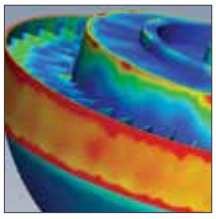
Performance Features

Heat sink is aesthetically pleasing with concealed fins while optimizing LED thermal management.

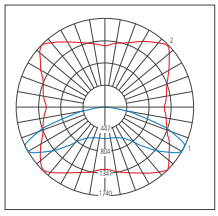
Die-cast housing is thermally optimized to isolate temperature sensitive drivers from heat emitting components, optimizing performance.

Clear textured polycarbonate drop lens reduces glare, provides even illumination and uplight.

Embedded microwave motion-sensing controls make TekDek an ideal option for cold storage and other low occupancy applications.



Patented heat sink conducts heat away from the LEDs and driver to the perimeter of the fixture, supporting long-life operation.



Multiple optical distributions, including wide distribution for low mounting heights.

Performance Data

Model	Lamp Code	Delivered Lumens (lm)	Efficacy (lm/W)	Input Power (W)	Est. L70 LED Life (Hrs)
EPTD17	49L	5507-7151	98-128	56	150,000
	75L	7391-9596	91-119	81	125,000
	104L	8800-11426	78-102	113	110,000

Lumen data based on Type 5N-TA performance. See specification sheet for other options and performance.

The EnviroPro™ Cylinder Luminaire Series

Kenall's cylindrical (EPC Series) luminaires are designed for zones that require low-to-medium mounting height, high-CRI lighting, such as inspection areas. These FDA /USDA compliant, NSF2 Food Zone/Non-contact certified fixtures are also an excellent solution for areas where high pressure hosedown and quick serviceability are key. These fixtures are built to withstand the harsh environments found in most food, meat, poultry and beverage processing applications, including freezers.

Features

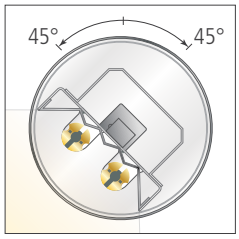
- Available in 4' and 8' lengths
- One-piece, high impact extruded acrylic lens featuring a high efficiency optical system
- LED Lumen packages up to: 8,300 lm
- 80 CRI
- Available in LED and fluorescent lamp sources, including a coated amalgam option
- Two point mounting: surface or suspended installation

Performance Features

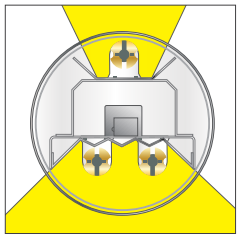
End caps available in stainless steel or antimicrobial finish. Wing-nut assembly offers tool-less entry for ease of relamping and maintenance.

External mounting clamp latches with the quick disconnect option makes installation a snap.

High impact extruded acrylic lens features a highly efficient optical system.



Easily rotatable up to 45° in either direction from vertical, to provide directed task lighting.



Optional source configurations provide an uplighting component to the fixture if required.

LED

SimpleSeal™ Flush Lens Downlight Series

Kenall's SimpleSeal™ Flush Lens (CDL Downlight Series) luminaire features a corrosion resistant trim ring, smooth flush lens surface, and an IP65 rating, all of which enable it to withstand daily cleanings.

Features

- Available in 6" aperture
- Sealed housing and trim ring
- Smooth exterior flush lens in choice of acrylic, polycarbonate, or tempered glass
- Integral emergency battery packs available
- UL/cUL Wet Location listed
- UL Classified IP65 per IEC 60598
- NSF2 Splash/Non-Food Zone listed

Performance Data

Model	Lamp Code	Delivered Lumens (lm)	Efficacy (lm/W)	Input Power (W)	Est. L70 LED Life (Hrs)
CDL6VL2	13L30K	1000-1125	63-80	16	125,000
	13L35K	1141-1283	71-80	16	125,000
	13L40K	1141-1266	71-79	16	125,000
	13L50K	1141-1266	71-79	16	125,000

Lumen data based on Type 5N-DTA performance. See specification sheet for other options and performance.

Sealed Exit Signs

SimpleSeal™ CMEXR

Wet Locations

Kenall's sealed exit signs resist leakage and surface contamination more effectively than any other exit signs on the market.

Features

- Semi-Recess mount with polished stainless steel doorframe (CMEXR)
- Surface mount wall or ceiling mount, single or double face (MET_U)
- Indirect red or green LEDs
- Internal battery backup system
- Cold temperature options
- High impact polycarbonate lens

For detailed product listings consult specification sheets

METSU/METDU

NSF Protocol P442-2015 Controlled Environment Lighting Fixtures

This protocol is a series of minimum requirements for the design, construction, performance and certifications of luminaires for cleanrooms. Intended to protect the controlled environment from the common causes of particulate contamination related to or resulting from the use of lighting fixtures, this protocol first requires ingress protection IEC 60529/60598 (IP65) and NSF2 food equipment certifications. In addition, there is a new performance testing requirement for pressure decay resistance similar to our K230 test.

This new testing requirement is demanding: the sealed fixture is stressed with positive and negative pressure and acceptance is granted only after it is proven that no leaks are present. This type of testing is particularly beneficial for pharmaceutical and semiconductor manufacturing, bio-tech research, biosafety labs, clean rooms, and surgical suites.

Kenall is the first manufacturer to be certified to this new standard, which affirms that Kenall's design and materials are the preeminent choice for even the most stringent clean environments

Fixtures for use in Food Processing, Handling & Preparation

Kenall lighting fixtures for use in food processing, handling and preparation areas have been investigated and listed by the National Sanitation Foundation (NSF) as conforming to the requirements in their criteria NSF2.

The purpose of criteria NSF2 is to insure that equipment located in a food storage, handling, or preparation area will not compromise the sanitation requirements for those areas. Equipment listed to criteria NSF2 has been evaluated as to its corrosion resistance, cleanability and exposed material.

Specifically, exposed materials shall withstand normal wear, the corrosive action of foods, beverages, and cleaning compounds, and the material itself shall not impart an odor, color, taste or toxic material to any food that would come in contact with it.

Within this category, NSF defines the surfaces of equipment as Food Contact or Non-Food Contact surfaces. Food Contact surfaces are further divided into areas as Food Zone, Splash Zone, and Non-Food Zone, with Food Zone requirements being the most stringent and Non-Food Zone being the least stringent. A subcategory of Food Zone equipment is Non-Contact, i.e. equipment in the Food Zone, but not normally in contact with the food.

Splash Zones (SN)

Kenall has two levels of fixture construction depending on the area where the fixtures are being installed.

Our SN type construction is listed for use in Splash Zones and Non Food Zones. All exposed sheet metal will be painted cold rolled steel (CRS), painted aluminum, or anodized aluminum. Fasteners will be stainless steel, and lenses can be acrylic, polycarbonate or tempered glass, all with prisms on inside.

Food Zones (FN)

The higher level of construction is our FN type construction for Food Zone/Non-Food Contact. Fixtures in this category are physically located in food preparation and handling areas but do not come in contact with food under normal conditions. All exposed sheet metal will be painted CRS, painted aluminum, or anodized aluminum. Paint must meet U.S. Code of Federal Regulations, Title 21 to be used in this application. Fasteners will be stainless steel and removable without the use of a tool (thumbscrew type) and the outer exposed lens must be an FDA approved Food Grade polycarbonate material.

Kenall cannot recommend which level of construction is suitable for your specific application as the final decision will rest with the local inspector.

NSF Food Zone Classifications

NSF Certification	Equipment Location, Use, and Explanation	Common Lighting Applications
Non-Food Zone	All exposed surfaces other than food or splash zone.	Kitchens, dry process areas, food storage areas, and damp process areas
Splash Zone	Surfaces other than food zone subject to routine splash, spillage, or other soiling during normal use.	Wet or damp processing areas where decontamination or high pressure hose washdowns are routinely performed
Food Zone	Surfaces which the food normally contacts, and those surfaces from which the food may drain, drip, or splash back onto surfaces normally in contact with food.	Not generally applicable to lighting equipment

Food Processing is an industry with strict requirements and government oversight by the U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA). In addition, the Food Safety and Inspection Service (FSIS), which is an arm of the USDA, has even more stringent requirements for inspection areas within Food Processing facilities.

USDA Minimum Lighting Requirements

Area	Meat	Poultry
General	30 fc	30 fc
Coolers	30 fc	X
Freezers	30 fc	X
Dry Storage	30 fc	X
Ante-Mortem Inspection	30 fc	30 fc
Suspect Pen Inspection	50 fc	X
Inspection Stations	50 fc	X
Inspection Stations (Traditional)	X	50 fc
Inspection Stations (NELS/SIS/NTI)	X	200 fc
Pre and Post chill Inspection	X	200 fc
Establishment Quality Control Inspection	50 fc	200 fc
Reconditioning and Reinspection	50 fc	200 fc
All other Areas	30 fc	30 fc

Recommendations for Food Processing Lighting
(average maintained footcandles)

Task	Illuminance horizontal	Uniformity (max:min)
General Food and Beverage Manufacturing		
Loading Areas	10-20	10:1
Boiler Rooms	5-10	3:1
Food Storage	5	5:1
Control Areas	5-10	3:1
Catwalks and Platforms	2-5	4:1
Corridors	10-30	5:1
Food and Beverage Processing		
Raw Material Processing	10-100	3:1
Wrapping, Packaging, Labeling	5-30	10:1
Warehousing, Staging	30	10:1
Inspection	30-1000	3:1
Grading and Sorting	75-150	3:1
Boiling and Keg Washing	30	10:1
Color Grading	150	3:1
Canning	75	3:1
Bottling	30-75	3:1
Maintenance	50	3:1
Meat and Dairy		
Slaughtering	30	10:1
Cleaning, Cutting, Cooking, Grinding	30	10:1
Gauges, Meter Panels, Thermometers	75	3:1
Pasteurizers	30	10:1
Vats and Tanks	15-75	3:1
Feed Storage	3-7	5:1
Milking Operations	15-30	5:1
Milk Handling	15-75	3:1
Flour Mills		
Rolling, Sifting, Purifying	75	3:1
Packing	30	10:1
Product Control	150	3:1
Poultry		
Brooding, Hatcheries	15	10:1
Egg Processing, Handling, Packing, Shipping	75	3:1
Fowl processing	75	3:1
Feed storage	15-30	5:1

Limitations of Wet & Hosedown Ratings – UL Standards

UL standards for "Wet" type ratings only offer a Wet Location rating, which simulates an outdoor rain condition. UL standards for a type 4 or NEMA 4 "hosedown" rating uses a 1 inch diameter nozzle on a fire hose delivering 65 gallons of water per minute. Various conditions exist where a fixture requires a rating better than a wet location label but not NEMA 4. These conditions typically exist in washdown applications where hose directed water or cleaning agents will be directed at the fixture.

Benefits of Ingress Protection Ratings – IEC standards

The IP water rating of "5" (IP_5), described in IEC Standard 60598, provides an intermediate step between the rain rating and the NEMA 4 rating. It also provides an internationally accepted standard which can be used to evaluate fixtures or any other electrical equipment, and the test can be performed by an independent third party testing agency for verification. Underwriters Laboratories investigates products and tests to the IEC standard.

Dust-tight Protection

An additional test criterion that can be applied to fixtures is the ability to exclude solid matter. The IP solid rating of "6" (IP6_) means the fixture will be dust tight. The specified test requires that the fixture be placed in a circulating talc atmosphere for 3 hours. The particle size of the talc is a range of one to 75 microns and the fixture is placed under negative pressure in an attempt to draw the talc into the fixture. No talc shall be found inside the fixture after this test.

IP Standards Characteristics

Rating	Standard	Nozzle Dia	Flow Rate	Distance	Duration
IP_5	IEC 60598	0.2 inches	3.3 gal/min	8-10 ft	15 min
NEMA4	NEMA 250	1.0 inches	65 gal/min	10-12 ft	5 min
Marine	UL 595	1.0 inches	115 gal/min	10 ft	5 min

NEMA Enclosure Types

In non-hazardous locations, the specific enclosure types, their applications, and the environmental conditions they are designed to protect against, when completely and properly installed, are as follows:

Type 4X enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose directed water); that provides an additional level of protection against corrosion; and that will be undamaged by the external formation of ice on the enclosure.

The Importance of Recognized Standards & Independent Testing

Other lighting manufacturers that claim a hosedown rating other than NEMA or IP are not testing to recognized standards and cannot have the tests confirmed or audited by an independent outside testing agency.

Beware of statements such as "Tested to 75psi at 1 inch." No reference is made to the volume of water that is leaving the nozzle and impacting the product. In fact, high nozzle pressures typically have low water volumes because the nozzle is restricting the flow of water causing the pressure in the hose to increase, minimizing the amount of water leaving the nozzle.

Regardless of the hose pressure, any water volume less than 3.3 gal/minute is less severe than the IP_5 test. The most relevant characteristics are the diameter of the nozzle and the flow rate of the water. The following chart shows the test characteristics for various Standards.

What are IEC Standards?

IEC Standards are international standards that many European countries adopt as their national standard. North America has traditionally adopted UL standards as the source for standards. U.S. product manufacturers designed their products to IEC standards initially for sale overseas but are finding them increasingly useful here in North America.

EXPLANATION OF "INGRESS PROTECTION" IP NUMBERS
for Degrees of Protection for Sealed Luminaires

Example:
IP65

DEGREES OF PROTECTION INDICATED BY THE FIRST CHARACTERISTIC NUMERAL

Numeral	Short Description	Brief details of objects which will be "excluded" from the enclosure
0	Non-protected	No special protection
1	Protected against solid objects greater than 50 mm	A large surface of the body, such as a hand (but no protection against deliberate access). Solid objects exceeding 50 mm in diameter.
2	Protected against solid objects greater than 12 mm	Fingers or similar objects not exceeding 80 mm in Solid objects exceeding 12 mm in diameter.
3	Protected against solid objects greater than 2.5 mm	Tools, wires, etc., of diameter or thickness greater than Solid objects exceeding 2.5 mm in diameter.
4	Protected against solid objects greater than 1.0 mm	Wires or strips of thickness greater than 1.0 mm. Solid objects exceeding 1.0 mm in diameter.
5	Dust-protected	Ingress of dust is not totally prevented but dust does not enter in sufficient quantity to interfere with satisfactory operation of the equipment.
6	Dust-tight	No ingress of dust

IP65

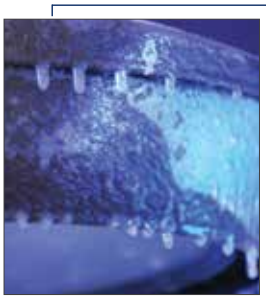
DEGREES OF PROTECTION INDICATED BY THE SECOND CHARACTERISTIC NUMERAL

Numeral	Short Description	Brief details of objects which will be "excluded" from the enclosure
0	Non-protected	No special protection
1	Protected against dripping water	Dripping water (vertically falling drops) shall have no harmful effect.
2	Protected against dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when tilted up to 15° when the enclosure is tilted at any angle up to 15° from its normal position.
3	Protected against spraying water	Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect.
4	Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effect.
5	Protected against water jets	Water projected by a nozzle against the enclosure from any direction shall have no harmful effects.
6	Protected against heavy seas	Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.
7	Protected against the effects of immersion	Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time.
8	Protected against submersion	The equipment is suitable for continuous submersion in water under conditions which shall be specified by the manufacturer. NOTE – Normally, this will mean that the equipment is hermetically sealed. However with certain types of equipment it can mean that water can enter but only in such a manner that it produces no harmful effects.

State-of-the-art, certified testing facility

Kenall is equipped with a state-of-the-art certified safety laboratory, providing comprehensive in-house testing capabilities:

Thermal Testing



Cold Weather Testing

High Temperature Testing

Photometrics Testing

Ingress Testing

Solids and Particulates Testing

Water Ingress Testing

Lighting Challenging Environments

Kenall offers luminaires designed according to industry best practices and certified performance standards in each market segment we serve. From high abuse fixtures with an exclusive Peace of Mind Guarantee® against breakage and healthcare fixtures sealed for infection control, to sealed enclosure fixtures that comply with stringent military standards for RFI/EMI and food processing fixtures that carry mission critical NSF, NEMA and IP ratings, our fixtures are designed with your specific needs in mind.

High Abuse
HA

Guaranteed against breakage for the life of the installation.

Main Applications

- Schools & Universities
- Public environments
- Military
- Restrooms & stairwells

Healthcare
HC

Engineered to the specialized demands of healthcare environments with particular attention to cleanability and infectious control.

Main Applications

- Patient rooms
- Surgical suites
- MRI
- Labs

Sealed Enclosure
SE

One-piece, seam-welded enclosures for containment, controlled and sealed spaces.

Main Applications

- Pharmaceutical & research labs
- Cleanrooms
- Corrosive environments
- Hazardous locations

High Bay
HB

Sealed enclosure lighting for hazardous and extreme industrial applications

Main Applications

- Warehouses
- Manufacturing
- Natatorium
- Cold storage

Lighting Challenging Environments

Whether you're lighting a healthcare facility and need fixtures that support effective infection control and cleanability, or a tunnel, transit platform or parking facility that calls for features like corrosion-, shock- and vibration-resistance, Kenall can help at every turn. And for dependable task lighting that requires environmental integrity and versatility, or emergency exit lighting that meets life safety codes, you can depend on Kenall.

Correctional
COR

Heavy gauge, welded enclosures to deter even the most determined attempts to destroy, enter or vandalize.

Main Applications
- Cells
- Common areas
- Behavioral health
- Dayrooms

Transportation
TR

Meeting the specialized demands of transportation-related structures for high performance, corrosion resistance and serviceability.

Main Applications
- Tunnel & underpass
- Platform & depot
- Parking deck & surface lot
- Bridges

Task Lighting
TL

High efficiency LED, modular undercabinet lighting for professional spaces.

Main Applications
- Nurses stations
- Labs/MRI suites
- University dorms & administration areas
- Military/Government

Emergency
EE

High-abuse, extreme-environment LED exit and emergency egress lighting.

Main Applications
- Schools & Universities
- Recreational
- Sealed & correctional environments
- Outdoor/cold weather/extreme conditions

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