

*The SimpleSeal® CSSGI Shallow Plenum Luminaire*  
*Ideal for Use in ISO Rated Cleanrooms & Clean Spaces*



SEALED ENCLOSURE



*Cleanrooms are facilities dedicated to specialized industrial manufacturing or scientific research. Typical cleanroom owners produce pharmaceuticals, integrated circuits, and LED monitors and televisions. Food processing facilities are highly driven by the need to keep food free from contamination, so cleanrooms are often utilized for these applications.*



Specialized ISO-Rated Space

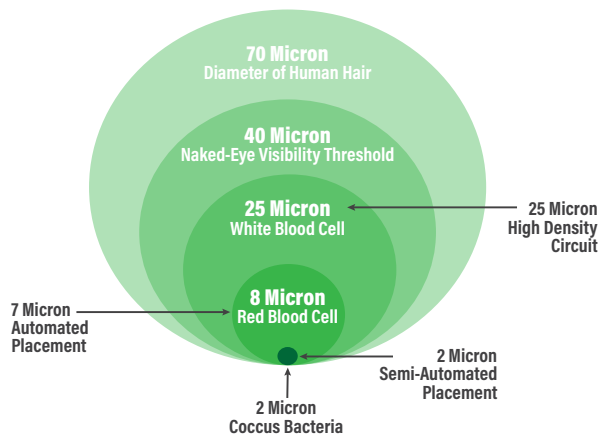
### ISO Cleanroom Ratings: A Primer

Cleanrooms are categorized by their ability to clean particulates in a specific area. Based on the room's ability to keep the air clean, the International Standards Organization assigns an ISO Cleanroom Rating. The room is cleaned by turning the air over via a high efficiency particulate

air (HEPA) filtration system, which filters the air in per cubic meter as it flows through the system (particles/m<sup>3</sup>). *Cleanrooms are classified by the number of particles of each size that are allowed to penetrate into the room as follows:*

ISO Class	Maximum concentration limits (particles/m <sup>3</sup> of air) for particles equal to and larger than the size listed below					
	0.1 micron	0.2 micron	0.3 micron	0.5 micron	1 micron	5 micron
ISO 1		2				
ISO 2		24	10	4		
ISO 3	1	237	102	35	8	
ISO 4	10	2,370	1,020	352	83	
ISO 5	100	23,700	10,200	3,520	832	29
ISO 6	1,000	237,000	102,000	35,200	8,320	293
ISO 7	10,000		1,002,000	352,000	83,200	2,930
ISO 8	100,000			3,520,000	832,000	29,300
ISO 9	(1.0 × 10 <sup>9</sup> )				8,320,000	293,000

The graphic below demonstrates the relativity of particle sizes:



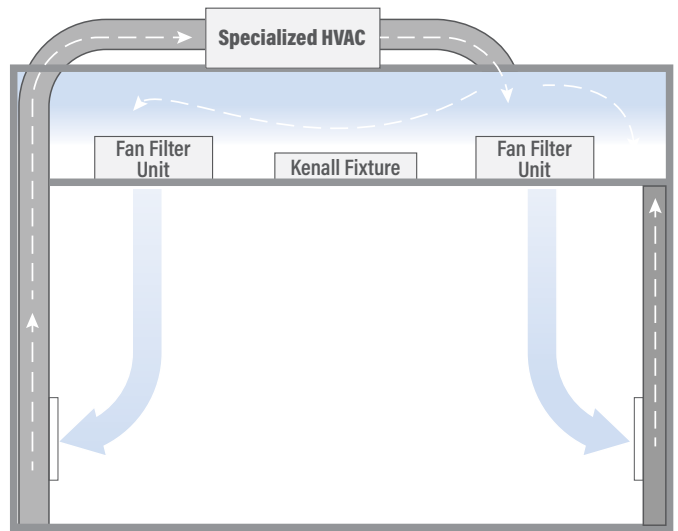
## Specifying Lighting for ISO Rated Spaces

ISO 1 and ISO 2 Cleanrooms are extremely specialized and rare. So rare, in fact, that very few exist in the world, and as a result, very few lighting manufacturers build luminaires suitable for these applications. Kenall manufactures lighting products suitable for most cleanroom applications (shown in Table 1).

Full integration into the cleanroom requires the following specialized lighting capabilities:

1. Luminaire to seal to the cleanroom ceiling
2. Luminaire to withstand the HVAC air pressure without bleeding air into the room prior to traveling through the HEPA filtration system (fan filter unit/FFU)
3. Luminaire to be maintained without breaking the seal created in #1 above. Generally, this is solved by using an ingress barrier door, which allows access to the inside of the luminaire via stainless steel fasteners, avoiding the need for room recertification

The diagram below demonstrates how Kenall luminaires integrate into a cleanroom environment:



While luminaires themselves do not carry ISO ratings, they are designed with specific features that support the stringent requirements of ISO rated spaces. When specifying lighting for these spaces, their design must support the specific ISO rating of their intended application. The following is a general guideline of ISO rated applications:

Table 1

ISO 3 and 4	ISO 5, 6, 7 and 8	ISO 9
<ul style="list-style-type: none"> <li>• Semiconductor manufacturing cleanroom (photolithography)</li> <li>• Medical device manufacturing cleanroom (final clean and packaging)</li> <li>• Pharmaceutical cleanroom - Aseptic filling</li> <li>• Aerospace – NASA satellite assembly, component manufacturing</li> <li>• R&amp;D cleanroom (Universities and Federal National Laboratories)</li> <li>• Hard disk manufacturing and repair</li> <li>• Pharmaceutical compounding</li> <li>• ULSI Water fabrication</li> <li>• Photo mask</li> <li>• Photo resist</li> </ul>	<ul style="list-style-type: none"> <li>• Ion lithium battery</li> <li>• Solar, medical device</li> <li>• Film/packaging</li> <li>• Fine chemical</li> <li>• ULSI Assembly Test</li> <li>• Liquid crystal displays</li> <li>• Transistors</li> <li>• Pharmaceutical cleanrooms</li> <li>• Medical device cleanrooms</li> <li>• Biotech cleanrooms</li> <li>• Life-science cleanrooms</li> <li>• ULSI Assembly Test</li> <li>• Silicon ingot</li> <li>• Computer disk assembly</li> <li>• Optical fiber</li> <li>• Miniature bearings</li> <li>• Optics for precision equipment</li> <li>• Precision measuring</li> <li>• Chemicals for ULSI manufacturing</li> <li>• Hybrid integrated circuit</li> <li>• Photo films</li> </ul>	<ul style="list-style-type: none"> <li>• Printed circuit boards</li> <li>• Precise printing</li> <li>• Dust free garment cleaning</li> <li>• Food processing</li> </ul>



## SimpleSeal CSSGI Series

- Delivered lumen range: 2,197 – 8,639 lm
- Input power: 23 – 69W
- Efficacy: 97 – 132 lm/W
- Suitable for ISO 5-8 cleanrooms and clean spaces
- Low profile design minimizes intrusion into the plenum space

Nominal sizes: 2' x 2', 2' x 4',  
(1' x 4' Coming Soon!)

Installation type: Grid

Lamp type: LED



Scan to View  
Product Detail

With the introduction of the **SimpleSeal™ CSSGI**, Kenall now offers a product suitable for **ISO 5-8 spaces**, ideal for a wide range of needs in cleanroom/clean space environments. Featuring an edge-lit light engine, *the design allows for minimal intrusion into the plenum space (<2.0" depth)* without compromising uniform lighting across the lens surface.

The CSSGI was designed with access to the internal housing and driver when installed, making it a more serviceable fixture than the competition.

The CSSGI is also available in a *Buy American Act* Compliant version. Designed with budgets in mind, this luminaire is ideal for clean spaces including laboratories, food processing plants, pharmacies and pharmaceutical manufacturing, research centers and more.



# SimpleSeal™ Products by ISO Rating

FAMILY	CATALOG	ISO 3	ISO 4	ISO 5	ISO 6	ISO 7	ISO 8	ISO 9
<b>OVERLAPPING DOOR SERIES</b>								
	CSECO		X	X	X	X	X	X
	CSEDO	X	X	X	X	X	X	X
	CSEFBO		X	X	X	X	X	X
	CSEPO	X	X	X	X	X	X	X
	CSESO		X	X	X	X	X	X
	CSETO		X	X	X	X	X	X
	HSEDO	X	X	X	X	X	X	X
<b>EXTENDED FLANGE SERIES</b>								
	CSEFL		X	X	X	X	X	X
	CSEGL		X	X	X	X	X	X
	CSESL		X	X	X	X	X	X
<b>INSET DOOR SERIES</b>								
	CSEDI		X	X	X	X	X	X
	CSERI		X	X	X	X	X	X
	CSESI		X	X	X	X	X	X
	CSSGI			X	X	X	X	X
	ESEDI		X	X	X	X	X	X
	HASEDI		X	X	X	X	X	X
	NFCSEDI		X	X	X	X	X	X
	NFCSESI		X	X	X	X	X	X
<b>TOP &amp; PLENUM ACCESS SERIES</b>								
	CSEPO	X	X	X	X	X	X	X
	CSETO		X	X	X	X	X	X
<b>HAZARDOUS LOCATION SERIES</b>								
	HSEDO	X	X	X	X	X	X	X
	HSESO		X	X	X	X	X	X
<b>DOWNLIGHT SERIES</b>								
	CDL6-FF		X	X	X	X	X	X
	CDL6-NF			X	X	X	X	X
<b>ARCHITECTURAL SERIES</b>								
	CRS4		X	X	X	X	X	X
	CSEA		X	X	X	X	X	X



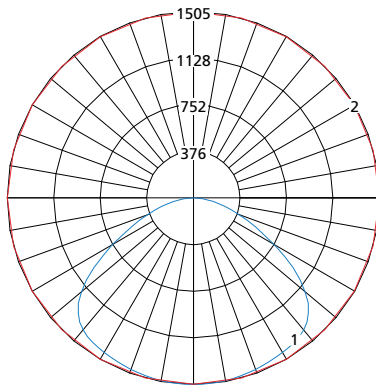
# Uniform Lighting Across the Lens Surface

## Edge Lit Light Engine

### TECHNICAL DATA

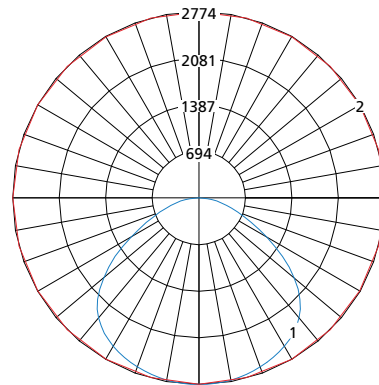
Model: CSSGI-22-G-36L-40K8-uu-vv-ww-4H-yy-zz

Model: CSSGI-24-G-65L-40K8-uu-vv-ww-4H-yy-zz



Maximum Candela = 1505 Located At Horizontal Angle = 75, Vertical Angle = 2.5

- 1 - Vertical Plane Through Horizontal Angles (75-255) (Through Max. Cd.)
- 2 - Horizontal Cone Through Vertical Angle (2.5) (Through Max. Cd.)



Maximum Candela = 2774 Located At Horizontal Angle = 15, Vertical Angle = 2.5

- 1 - Vertical Plane Through Horizontal Angles (15-195) (Through Max. Cd.)
- 2 - Horizontal Cone Through Vertical Angle (2.5) (Through Max. Cd.)

### PERFORMANCE

Size	Lamp Power	Initial Delivered Lumens, By Lamp Color (lm)						Efficacy (lm/W)	Input Power (W)	TM-21 Reported L70 (hrs)
		30K8	35K8	35K9	40K8	40K9	50K8			
2' x 2'	20L	2,561	2,587	2,197	2,678	2,262	2,704	97 - 119	23	>72,000
	24L	3,197	3,230	2,743	3,343	2,824	3,376	102 - 126	27	
	27L	3,421	3,456	2,935	3,577	3,021	3,612	102 - 126	29	
	33L	4,023	4,064	3,451	4,207	3,553	4,247	100 - 124	34	
2' x 4'	36L	4,486	4,531	3,848	4,691	3,962	4,736	102 - 125	38	>72,000
	26L	3,564	3,600	3,058	3,727	3,148	3,763	107 - 131	29	
	38L	5,320	5,374	4,564	5,563	4,699	5,617	107 - 132	43	
	46L	6,243	6,306	5,355	6,528	5,514	6,591	106 - 131	50	
	54L	6,725	6,794	5,769	7,033	5,940	7,101	101 - 124	57	
65L	8,182	8,265	7,019	8,556	7,227	8,639	101 - 125	69		

NOTE: Information subject to change without notice. All testing conducted by an ILAC/ISO17025 accredited laboratory. Please visit [www.kenall.com](http://www.kenall.com) for IES files and additional information.

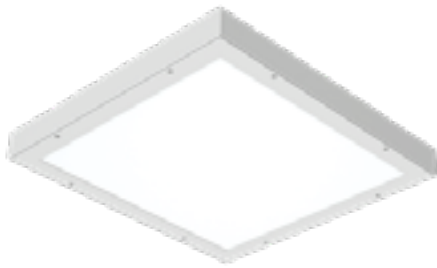


# Minimal Profile, Maximum Features

## Less Than 2" in Depth, Room-side Serviceability

### AVAILABLE SIZES

1'×4' Coming Soon!

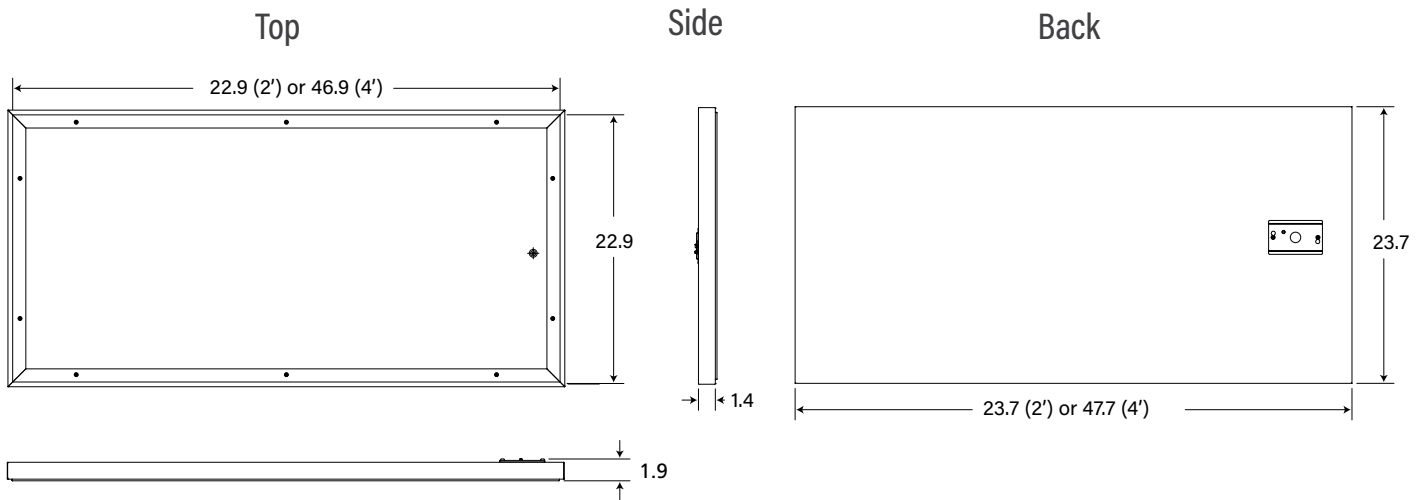


2'×2'



2'×4'

### DIMENSIONAL DATA





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