VLED™

Harnessing, Amplifying, and Vectoring the LED for Area Illumination

VLED™

LED's offer several inherent advantages for Outdoor Illumination due to their size, longevity, and energy saving potential. Within a system, LED's can surpass many of the shortcomings of HID-based systems in uniformity, glare control, and full-spectrum light output. Specialized optics that "vector" the LED's raw light output, careful control of the LED operating temperature, and a mechanical enclosure that will protect the LED's over their lifetime are all part of the new VLED™ Optical Modules from U.S. Architectural Lighting.

U.S. ARCHITECTURAL LIGHTING

PATENTS PENDING

VLED™ is a trademark of U.S. Architectural Lighting

ida

U.L. Listed for wet location

IP67

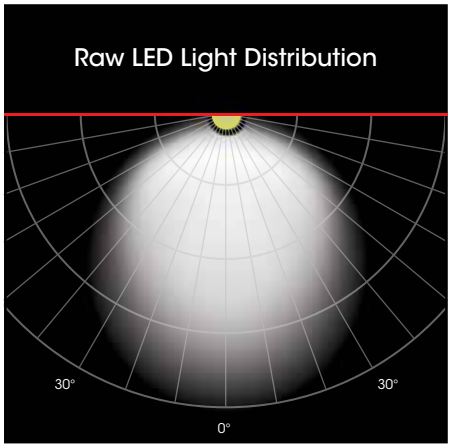
MADE IN THE USA

Parking Lot:
Aerolume Fixtures
on 20′ Poles
120**V LED**™ Type III

Building Entrance:
Mini-Aerolume Fixtures
on 12′ Poles
64**V LED**™ Type IV

Pathways:
Mini-Aerolume Fixtures
on 12′ Poles
64**V LED**™ Type III

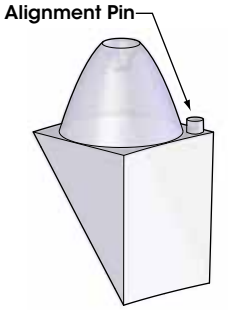
Optical Control



Challenge:

LED's offer a tremendous opportunity to conserve energy and provide precise placement of illumination. To take advantage of these qualities, it is essential to utilize the full output of each LED, given their relatively low illumination level when measured individually - - all without compromising life expectancy or efficacy. The output of an array of LED's must then be redirected efficiently to reproduce standard IES distribution types at illumination levels comparable to those produced by HID lamps.

VLED™ Solution:

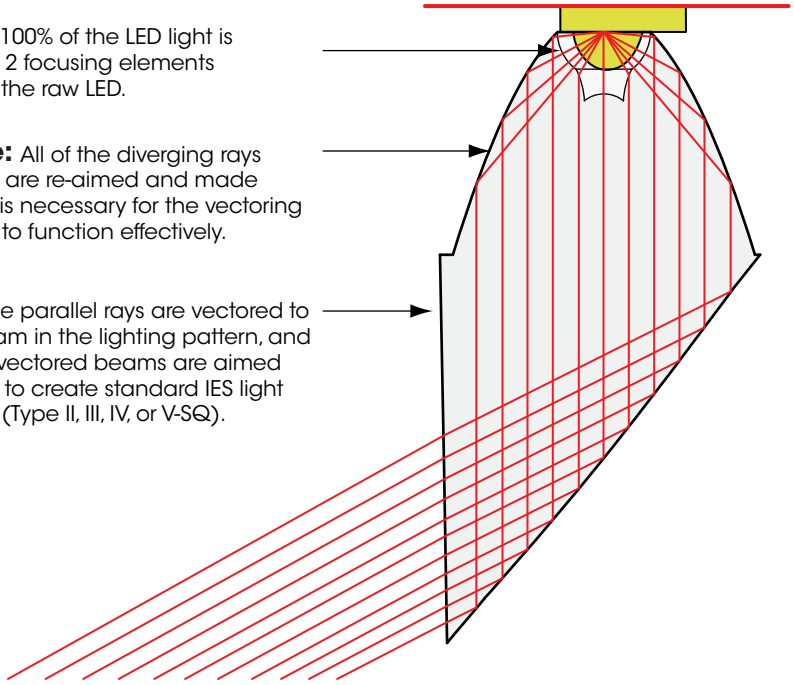


VLED™ Reflector-Prism for distribution pattern perimeter (high-angle). Note alignment pin for precise aiming.

Capture: 100% of the LED light is captured by 2 focusing elements surrounding the raw LED.

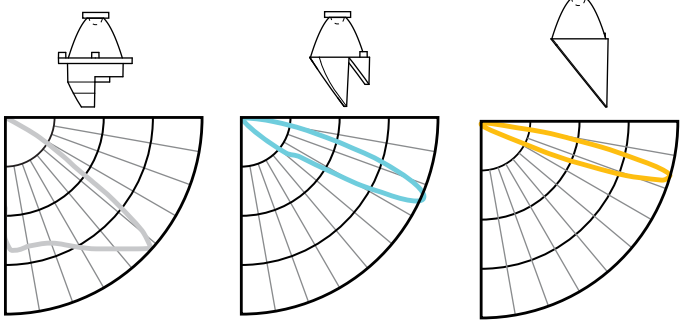
Collimate: All of the diverging rays from the LED are re-aimed and made parallel. This is necessary for the vectoring prism below to function effectively.

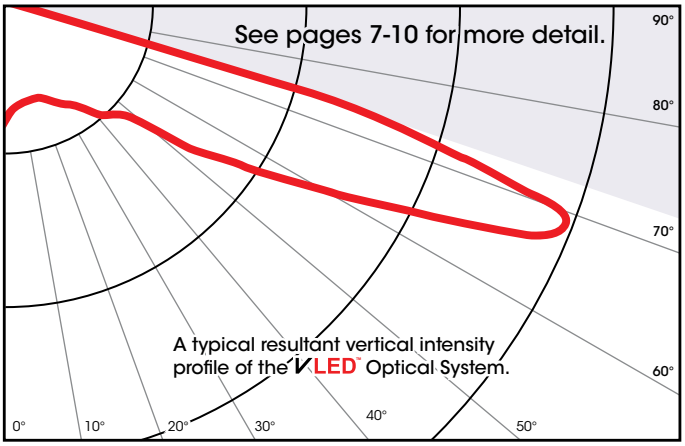
Vector: The parallel rays are vectored to create a beam in the lighting pattern, and the array of vectored beams are aimed (combined) to create standard IES light distributions (Type II, III, IV, or V-SQ).



Result:

The VLED™ system of three Reflector-Prisms with independent vertical control.





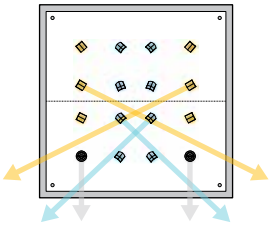
Versatility

Challenge:

Creating good visibility demands meeting minimum illumination requirements and maintaining excellent max-to-min balance (uniformity) while eliminating light pollution, light trespass, and glare.

VLED™ Solution:

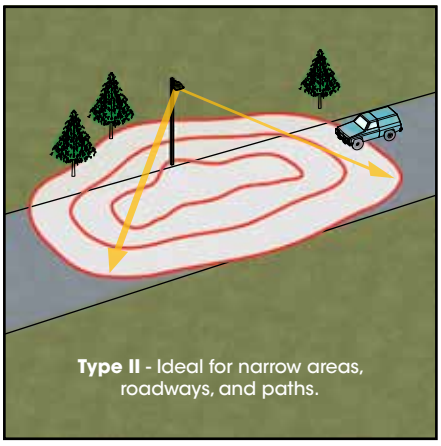
Each group of VLED™ Reflector-Prisms is aimed to cover one of three zones in the distribution pattern; one group from 0° - 50°; one group from 50° - 65°; one group from 65° - 72°. Unique combinations are used to create the individual IES distribution types.



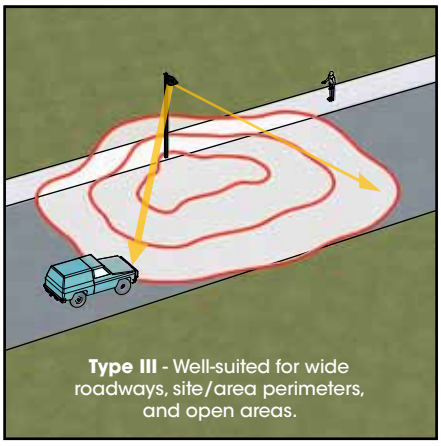
VLED™ Reflector-Prisms allow separate control of illumination directly below the luminaire versus the pattern perimeter.

Result:

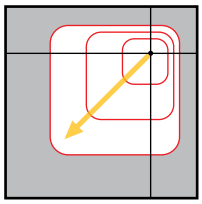
What separates VLED™ optics from HID and other LED systems are the concise shapes of the distribution patterns, the minimized waste light below and behind the luminaire, and excellent uniformity. In light of the new IES Luminaire Classification System (LCS), the VLED™ modules are tuned to minimize glare at high angles while maximizing high angle kick for superior spacing to mounting ratios. The modules produce zero up light and have minimal backlight without the use of shielding.

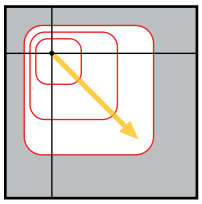


Type II - Ideal for narrow areas, roadways, and paths.

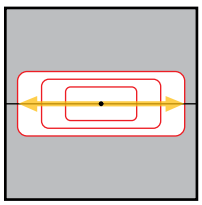


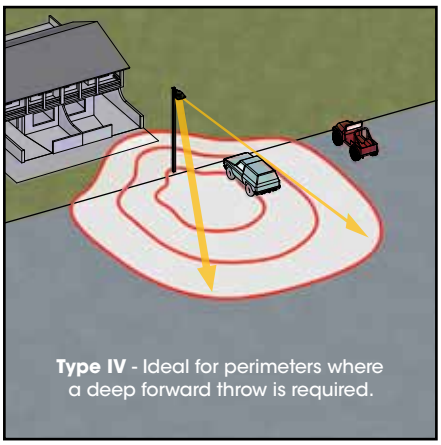
Type III - Well-suited for wide roadways, site/area perimeters, and open areas.



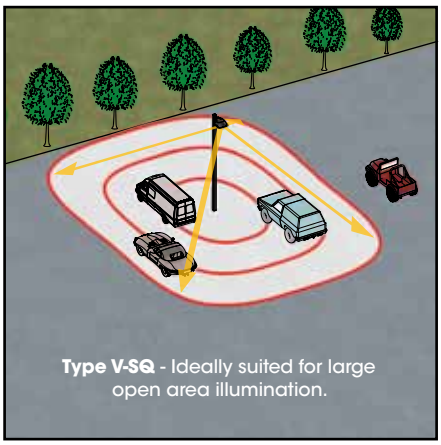


VLED™ Reflector-Prisms may be oriented to produce unique patterns to meet your specific project criteria. **Consult Factory.**





Type IV - Ideal for perimeters where a deep forward throw is required.



Type V-SQ - Ideally suited for large open area illumination.

Thermal Control

Challenge:

Heat is the enemy of all electronics. LED's suffer from adverse levels of heat in two ways: 1) Excessive heat can burn out the component prematurely; 2) A loss of light output will occur as they heat up. The cooler the system operates, the more efficient the LED's become. Controlling the heat will produce higher illumination levels and a greater life expectancy.

VLED™ Solution:

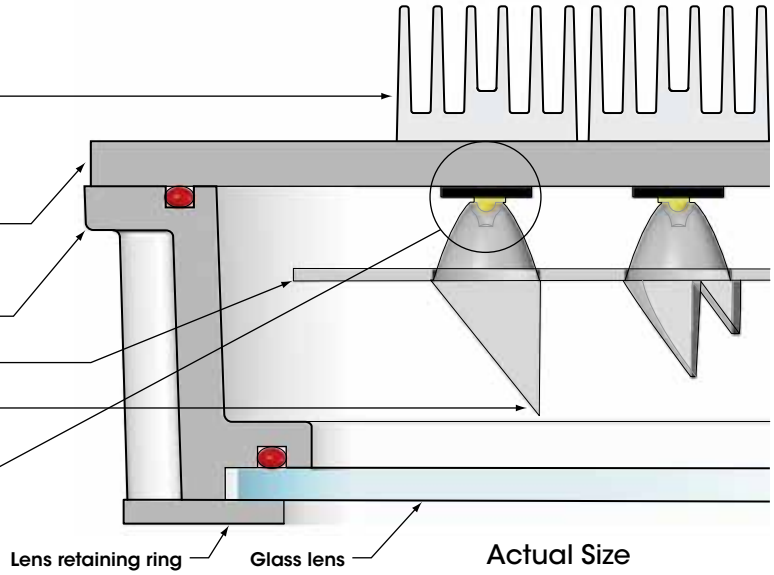
Heat sinks - Increase the radiating and convecting surface area of the rear seal plate. Screws fastening the circuit board to the seal plate thread directly into the heat sink.

Rear Seal Plate - Acts as a primary thermal conductor between the LED PCB and heat sinks.

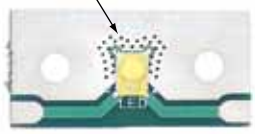
Module Housing

Optical Positioning Plate

Reflector-Prisms - 3 different configurations collect, collimate, and re-direct the LED output.



Conduction vias



LED PCB Front Component side

Conduction vias are copper lined "tubes" that increase thermal conductivity to transfer heat from the top of the PCB to the circuit board mounting surface and the heat sink.

LED PCB Back Mounting surface

Screw holes are copper lined to create a thermal path to the PCB screws and directly to the heat sinks.

Screw holes

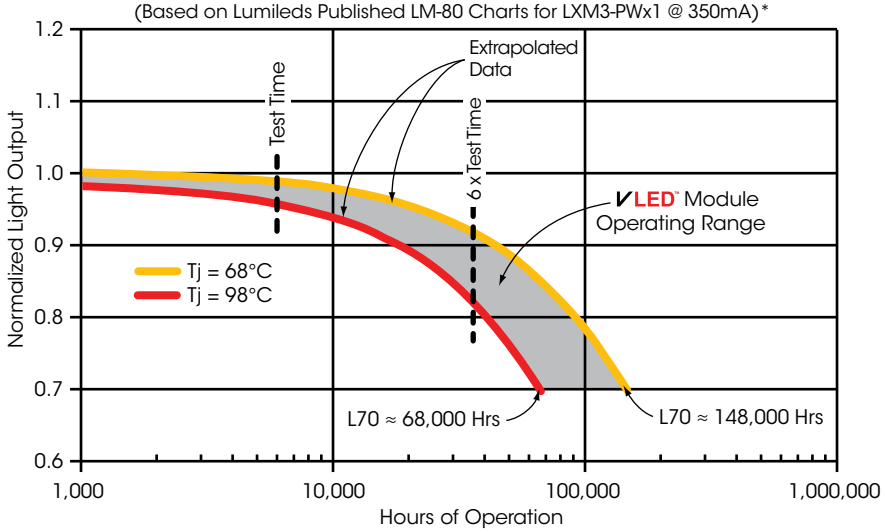
1.25 X Size

Results:

Keeping LED junction temperatures at their coolest adds to the system longevity and makes the LED's run more efficiently. This produces the highest illumination levels possible and maximizes LED performance.

VLED™ Lumen Maintenance Projection Chart for 350mA Operation

(Based on Lumileds Published LM-80 Charts for LXM3-PWx1 @ 350mA)*

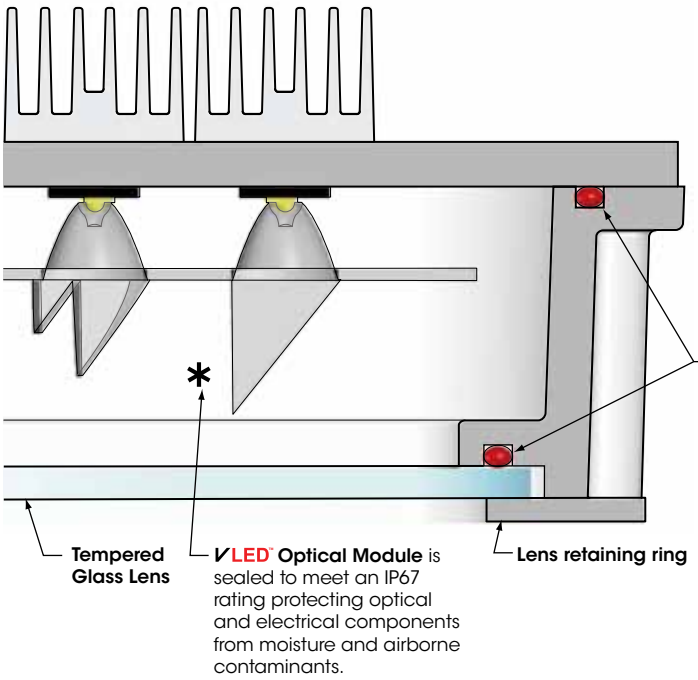


*See LM-80 Charts DR06 Publication From Lumileds http://www.philipslumileds.com

System Longevity

Challenge:

Outdoor luminaires are subject to extreme environments with temperature ranges from -50°F to +120°F, winds in excess of 120 MPH, and daily UV bombardment from sunlight. These elements can ravage the optical system over time. Protecting the optical components is critical for maintaining peak performance and longevity.



VLED™ Solution:

Optical modules are available square or round, in 64, 80 or 120 emitters and are completely sealed to meet an IP67 rating.

Typical Square Module

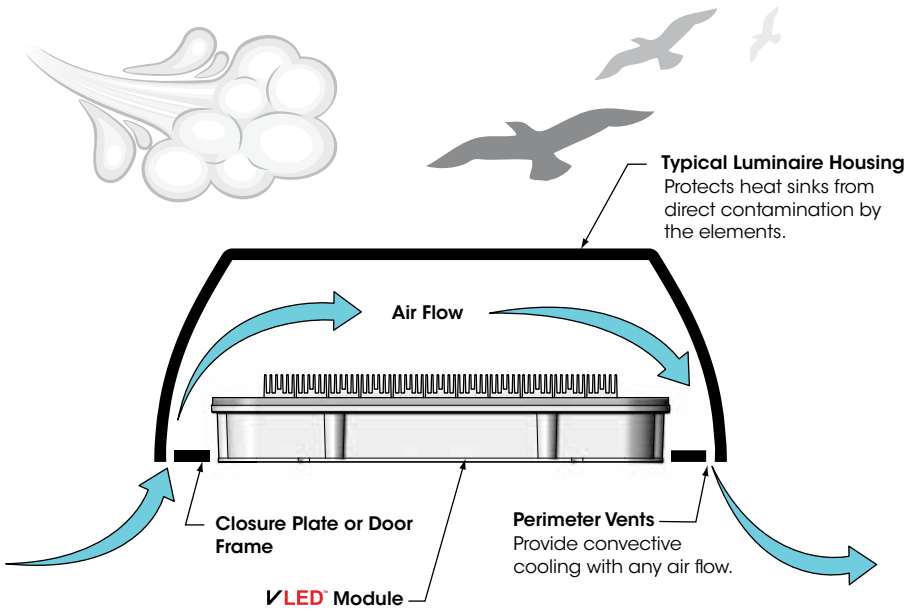
Typical Round Module

CAUTION: Specifiers should be aware that many manufacturers do not enclose their LED optics. This can lead to rapid optical deterioration substantially reducing luminaire efficiency.

Results:

VLED™ Optical Modules are completely sealed to meet an IP67 rating thereby withstanding the rigors of the outdoor environment over the lifetime of the LED's. By mechanically protecting the interior components (LED's and Refractor-Prisms) and controlling heat, the Light Loss Depreciation is minimized. Effectively, the expected light loss from the LED's over their lifetime is the only appreciable factor.

In addition, VLED™ Optical Modules are free to be rotated within the luminaire to meet site requirements and properly orient the distribution patterns. The luminaire design is free to be relevant to all forms of architecture without compromising aesthetics or system performance.



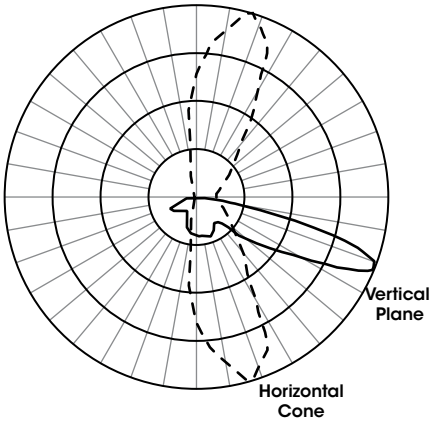
Performance

120 LED - Type II

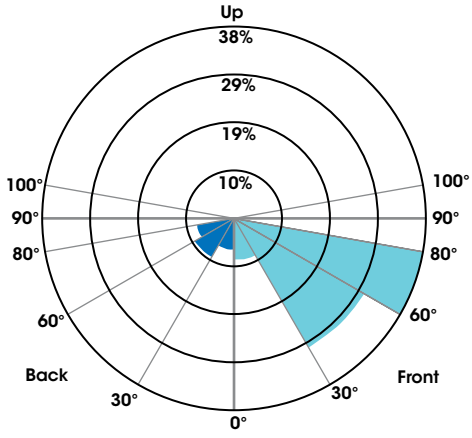
Test: ITL67443 (IESNA LM-79-08)
Optics: Type-II V LED Optical Module
LED's: 120 Luxeon Rebel ES Neutral White
LED Input Current: 350mA
Total Lumens: 7768
Total Input Watts: 130.8 @ 120 Volts

Max Candela Plot

8179 Candela At 69°Vertical, 73° Horizontal



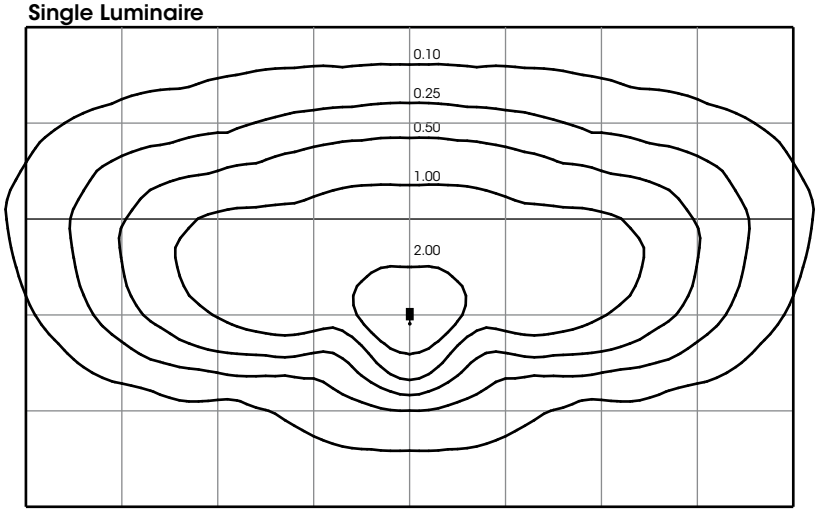
LCS Zonal Lumens



Vertical Range		Frontlight %LL (Lumens)	Backlight %LL (Lumens)
Low	(0°-30°) :	8.3% (642.4)	6.3% (487.2)
Medium	(30°-60°) :	29.5% (2289.2)	9.1% (705.1)
High	(60°-80°) :	38.3% (2971.6)	7.8% (605.8)
Very High	(80°-90°) :	0.7% (51.2)	0.2% (15.5)
	Total :	76.7% (5954)	23.3% (1814)
Uplight Low (90°-100°) :		0% (0)	BUG Rating :
Uplight High (100°+) :		0% (0)	B2 - U1 - G2

Note: Percentages are Luminaire Lumens, "%LL".

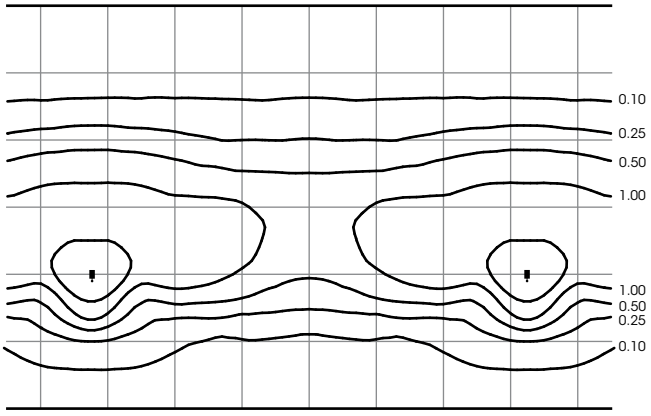
Single Luminaire



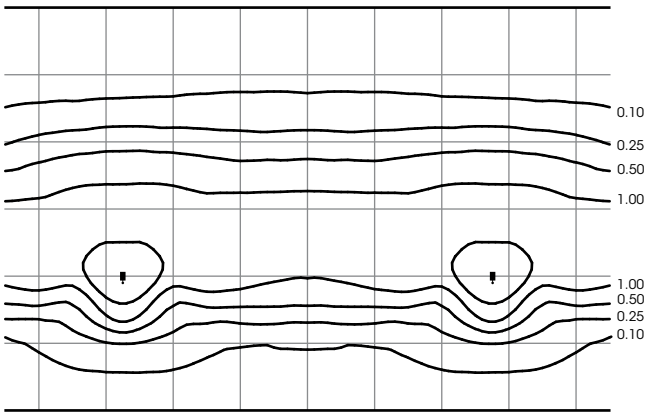
Isofootcandle Templates

20 ft Mounting Height All Templates
All Gridspacings = One Mounting Height = 20ft
Values Are Initial Footcandles At Grade
Maximum Footcandles For All Templates = 4.26

Two Luminaires, 130ft Spacing, 0.50 FC Minimum Between



Two Luminaires, 110ft Spacing, 1.00 FC Minimum Between



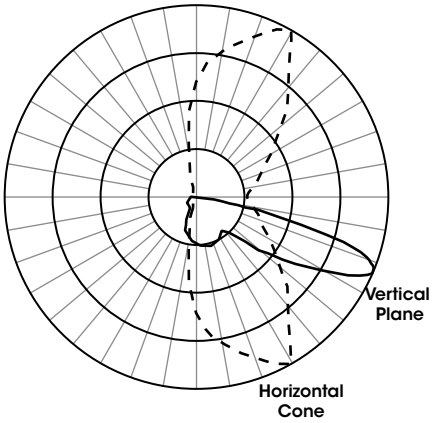
Performance

120 LED - Type III

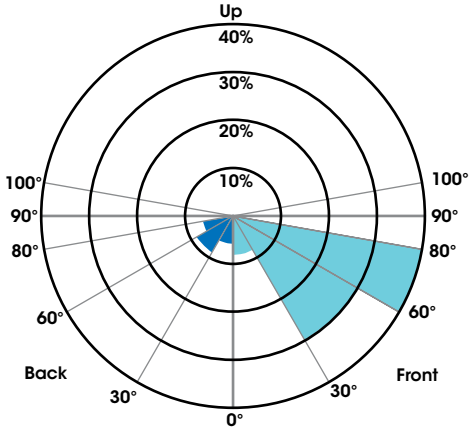
Test: ITL67444 (IESNA LM-79-08)
Optics: Type-III VLED™ Optical Module
LED's: 120 Luxeon Rebel ES Neutral White
LED Input Current: 350mA
Total Lumens: 7630
Total Input Watts: 131.3 @ 120 Volts

Max Candela Plot

6400 Candela At 67° Vertical, 60.5° Horizontal



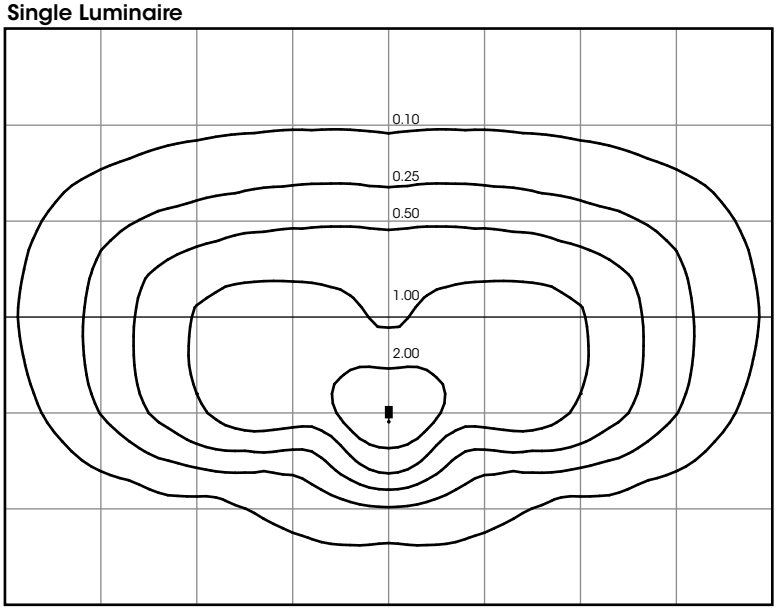
LCS Zonal Lumens



		Frontlight	Backlight
Vertical Range		%LL (Lumens)	%LL (Lumens)
Low	(0°-30°) :	8.2% (622.8)	6.0% (461.0)
Medium	(30°-60°) :	29.8% (2272.0)	8.9% (679.8)
High	(60°-80°) :	39.7% (3030.1)	6.5% (497.3)
Very High	(80°-90°) :	0.7% (56.0)	0.1% (10.2)
	Total :	78.4% (5982)	21.6% (1648)
Uplight Low (90°-100°) :		0% (0)	BUG Rating :
Uplight High (100°+) :		0% (0)	B1 - U1 - G2

Note: Percentages are Luminaire Lumens, "%LL".

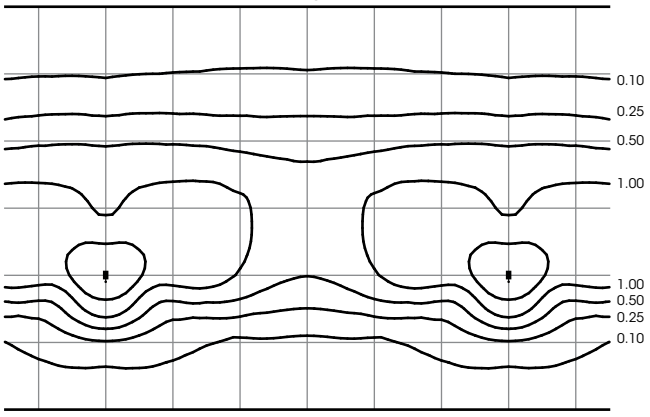
Single Luminaire



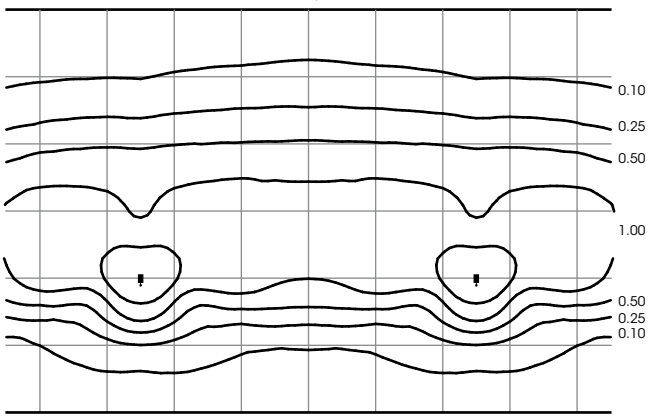
Isofootcandle Templates

20 ft Mounting Height All Templates
All Gridspacings = One Mounting Height = 20ft
Values Are Initial Footcandles At Grade
Maximum Footcandles For All Templates = 4.11

Two Luminaires, 120ft Spacing, 0.50 FC Minimum Between



Two Luminaires, 100ft Spacing, 1.00 FC Minimum Between



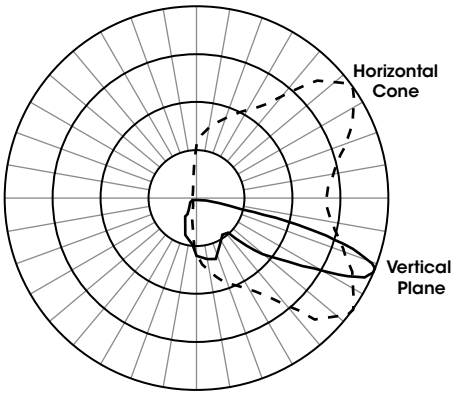
Performance

120 LED - Type IV

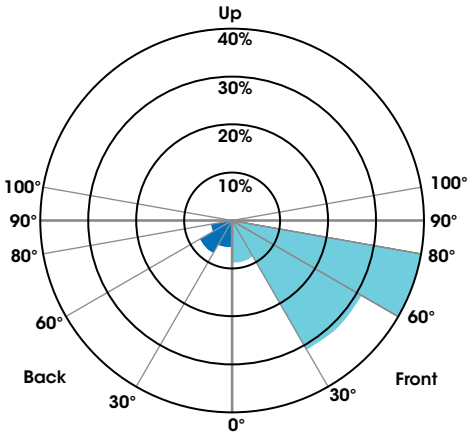
Test: ITL67445 (IESNA LM-79-08)
Optics: Type-IV ✓LED™ Optical Module
LED's: 120 Luxeon Rebel ES Neutral White
LED Input Current: 350mA
Total Lumens: 7781
Total Input Watts: 132.0 @ 120 Volts

Max Candela Plot

5987 Candela At 67.5°Vertical, 37° Horizontal



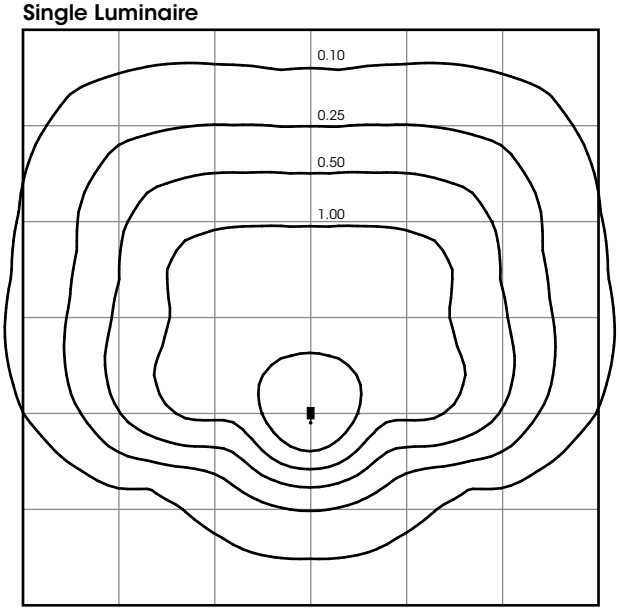
LCS Zonal Lumens



Vertical Range		Frontlight %LL (Lumens)	Backlight %LL (Lumens)
Low	(0°-30°) :	9.0% (700.4)	6.0% (463.3)
Medium	(30°-60°) :	31.8% (2471.1)	7.8% (607.6)
High	(60°-80°) :	40.4% (3146.1)	4.1% (322.1)
Very High	(80°-90°) :	0.7% (57.8)	0.2% (12.1)
	Total :	81.9% (6375)	18.1% (1405)
Uplight Low (90°-100°) :		0% (0)	BUG Rating :
Uplight High (100°+) :		0% (0)	B1 - U1 - G2

Note: Percentages are Luminaire Lumens, "%LL".

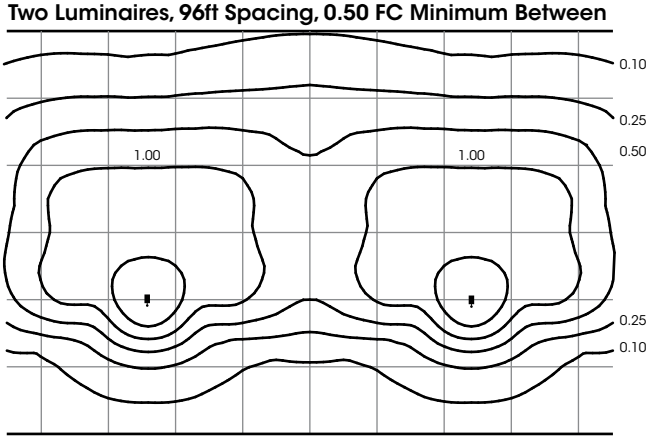
Single Luminaire



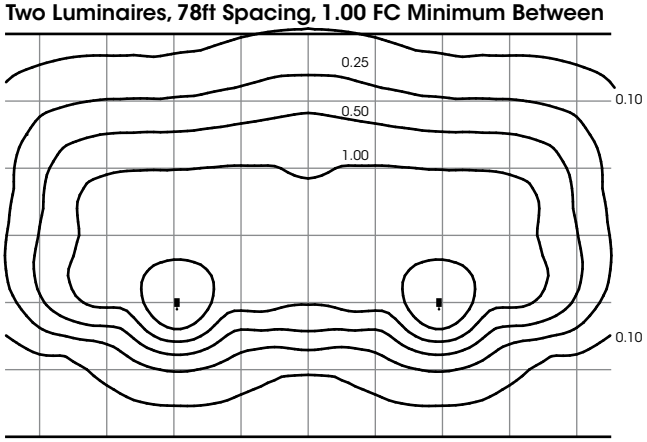
Isofootcandle Templates

20 ft Mounting Height All Templates
All Gridspacings = One Mounting Height = 20ft
Values Are Initial Footcandles At Grade
Maximum Footcandles For All Templates = 4.87

Two Luminaires, 96ft Spacing, 0.50 FC Minimum Between



Two Luminaires, 78ft Spacing, 1.00 FC Minimum Between



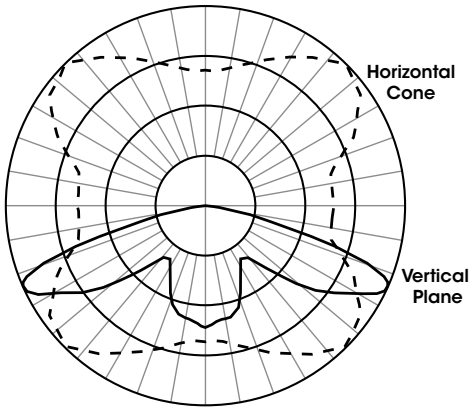
Performance

120 LED - Type VSQ

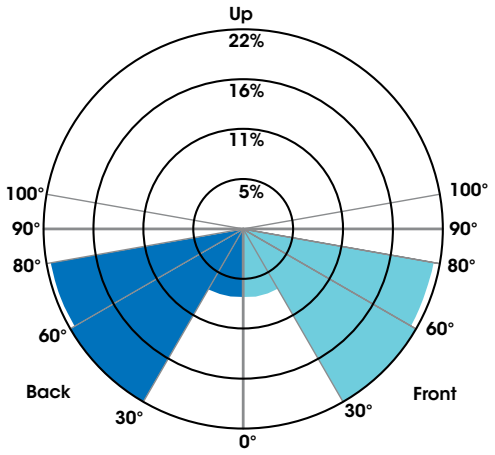
Test: ITL67446 (IESNA LM-79-08)
Optics: Type-VSQ VLED™ Optic Module
LED's: 120 Luxeon Rebel ES Neutral White
LED Input Current: 350mA
Total Lumens: 8128
Total Input Watts: 131.7 @ 120 Volts

Max Candela Plot

2956 Candela At 65°Vertical, 45° Horizontal



LCS Zonal Lumens

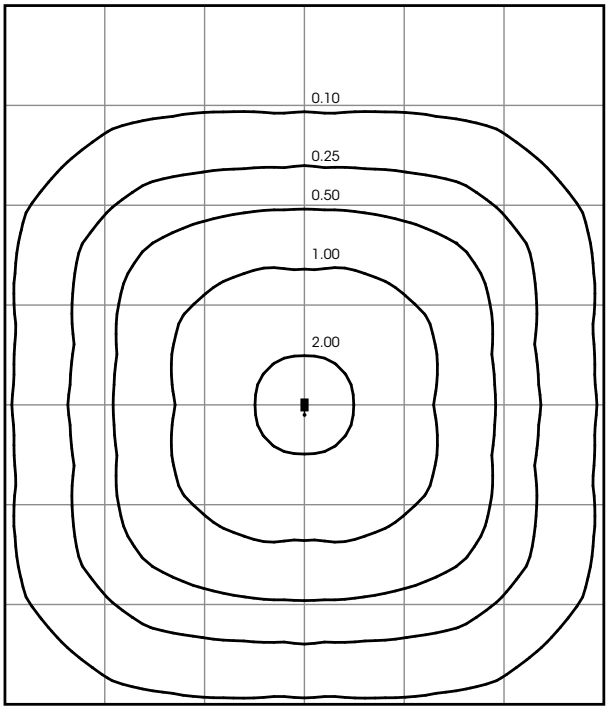


	Frontlight	Backlight
Vertical Range	%LL (Lumens)	%LL (Lumens)
Low (0°-30°) :	7.2% (587.8)	7.2% (587.8)
Medium (30°-60°) :	21.6% (1755.4)	21.6% (1755.4)
High (60°-80°) :	20.7% (1685.8)	20.7% (1685.8)
Very High (80°-90°) :	0.4% (35.0)	0.4% (35.0)
Total :	50% (4064)	50% (4064)
Uplight Low (90°-100°) :	0% (0)	BUG Rating :
Uplight High (100°+) :	0% (0)	B3 - U1 - G1

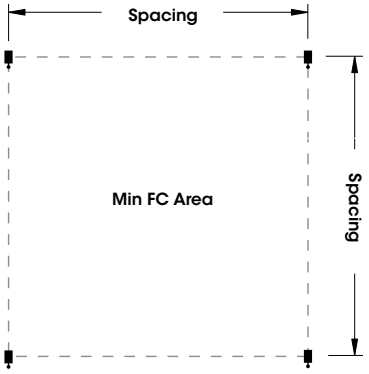
Note: Percentages are Luminaire Lumens, "%LL".

Isofootcandle Template

20 ft Mounting Height
All Gridspacings = One Mounting Height = 20ft
Values Are Initial Footcandles At Grade
Maximum Footcandles = 4.54



Square Spacing For Minimum FC Between Single Luminaires:



Spacing	Min FC	Max/Min
76 ft	1.00	4.60
90 ft	0.50	9.12

For more photometric performance data on other VLED™ Optical Modules consult factory or visit usaltg.com

U.S. ARCHITECTURAL LIGHTING V LED™

Series:		Unit:	LED's in Module: 64	80	120
	 AEROLUME - MINI AEROLUME	AERM AER	● 	 ●	 ●
	 GALAXY - MINI GALAXY	GLXM GLX	● 	● ●	 ●
	 DSB - MINI DSB	DSBM DSB	● 	● ●	 ●
	 DSS	DSS1 DSS2	 ●	● ●	●
	 DSA	DSA1 DSA25	● 	● ●	 ●
	 DSD	DSD1 DSD25	● 	● ●	 ●
	VIPER-R	VPR-R		●	
	 TSUNAMI - MINI TSUNAMI *Available in late 2010 **Available in mid 2010	TSUM* TSU**	●	●	●

See website for additional styles.
www.usaltg.com

NOTE: For specific project requirements consult factory.

SUN VALLEY LIGHTING VLED™

Series:		Unit:	LED's in Module: 64	80	120
 	MOZART	MOZ MOZM	● ●	● ●	●
 	SIGMA *Also available in 100	SIG1* SIG2	● ●	●	
	LCL		●		
	LCLS	LCLS 20"		●	●
	LCJ	LCJ1		●	
 	LCKM	LCKM1 LCKM2	● ●	●	
 	LCM	LCM CMP	● ●	●	●
	LCSC			●	
	LCGS			●	
	CTR			●	

Specifications

Optical Module - Sealed LED Optical Module. Low copper A356 alloy (<.2% copper) cast aluminum housing. Integrated clear tempered 3/16" glass lens sealed with a continuous silicone gasket protects emitters (LED's) and emitter Reflector-Prism optics, and seals the module from water intrusion and environmental contaminants. Entire module is IP67 rated.

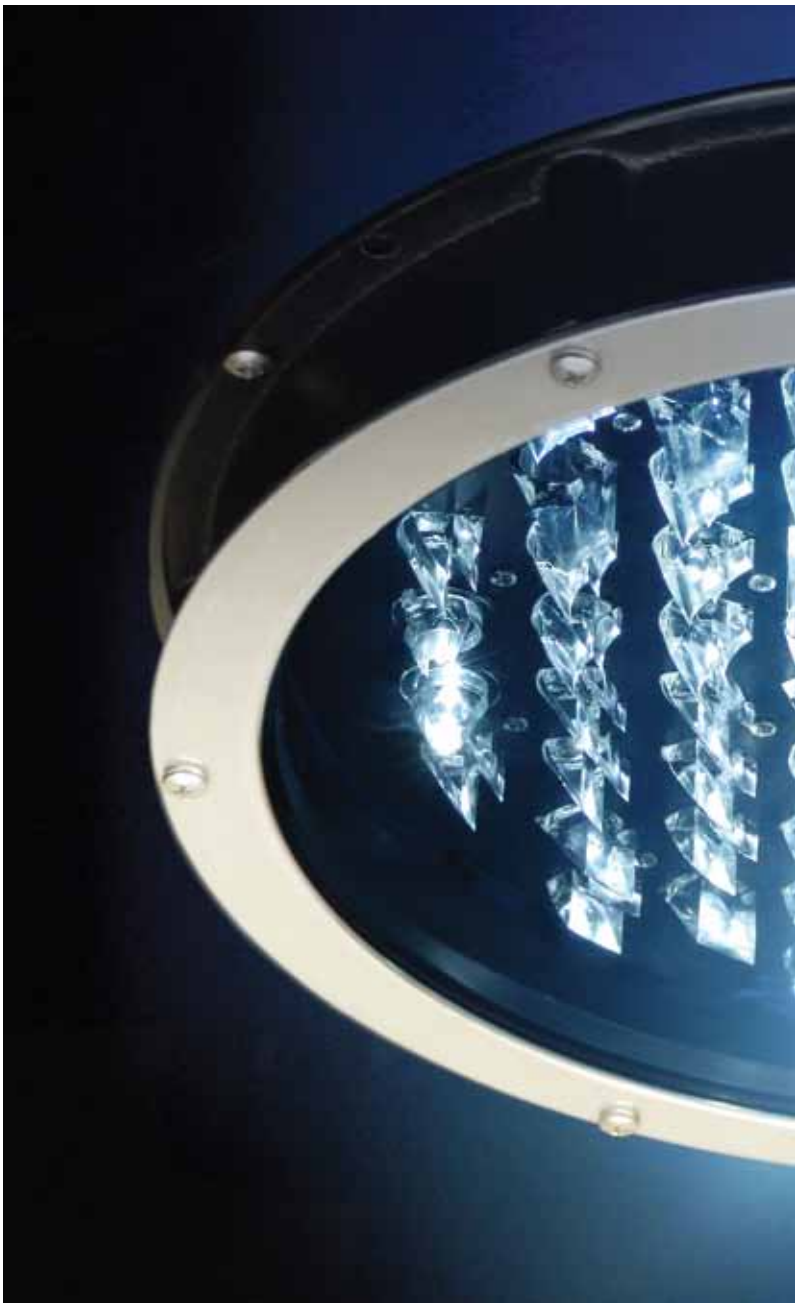
The emitters (LED's) are mounted to a vented circuit board. These "vias" are copper lined holes which conduct heat from the component side of the circuit board to the mounting side of the circuit board. Mounting screws are located between each emitter to secure the circuit board to the back panel of the optical module for heat transference to the heat sink. The PCB mounting screws thread into an extruded heat sink mounted to the back of the optical module.

Emitters (LED's) are Luxeon Rebel ES, high output, Neutral White nominal 4100K CCT for the entire module (Cool White nominal 6500K are available). Each emitter is optically controlled by a Reflector-Prism injection molded from H12 acrylic (3 types per module; one from 0° - 50°; one from 50° - 65°; one from 65° - 72°). Each Reflector-Prism has indexing pins for aiming and is secured to an optical plate made of matte black anodized aluminum. The optical plate locates every Reflector-Prism over an emitter. Reflector-Prisms are secured to the optical plate with a UV curing adhesive. The Reflector-Prisms are arrayed to produce IES Type II, IES Type III, IES Type IV, and IES Type V-SQ distributions. The entire VLED™ Optical Module is field rotatable in 90° increments. Both module and drivers are factory wired using water resistant, insulated cord. Lens, module and drivers are field replaceable.

Photometric test data in accordance with IESNA LM-79-08 test protocol is available.

LED life rating data shall be determined in accordance with IESNA LM-80-08.

Driver - LED driver module operates on input voltages from 120 - 277V, 50/60Hz. Driver is independently sealed and UL listed for wet location.



350mA Driver Current System Watts	
64 LED's	71W
80 LED's	89W
120 LED's	132W

Consult factory for additional electrical configurations.

VLED™

Harnessing, Amplifying, and Vectoring the LED for Area Illumination

U.S. ARCHITECTURAL LIGHTING

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