

Report of Test LLI-16282-12

Clarte Lighting - 6" downlight luminaire. Product ID: PAR 30 / Flood

Extruded aluminum housing with semi-specular trim ring.

Nine LEDs mounted in circular array to white PCB with clear plastic array of individual lenses.

PCB mounted to extruded aluminum heat sink.

One Clarte driver. Model: 615E55XP30N3HC5

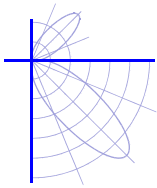
Operating at 120 VAC and 60 Hz.



Performance Summary

Total Light Output	3255 lm	Min Power Factor	0.85 @ 277 V
Luminaire Power	51.1 W	Max THD(i)*	11.3 % @ 277 V
Luminous Efficacy	63.7 lm/W		
CCT	2980 K		
CIE(x,y) 1931	(0.435, 0.397)		
CRI	82		

PREPARED FOR : Clarte Lighting, Azusa, CA



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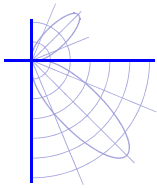
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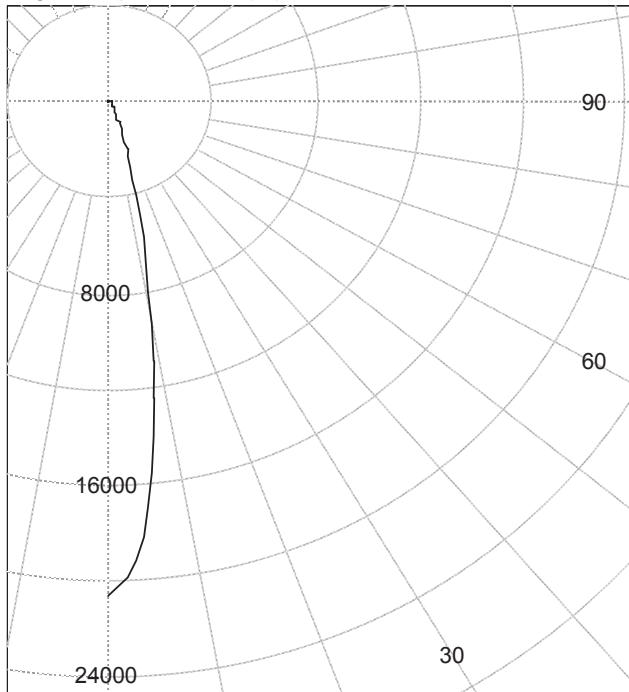
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Legend: All planes - Solid (cd)



(Rotational symmetry)

INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	20570		90	0	
5	16966	1363	95	0	0
10	9416		100	0	0
15	4035	1174	105	0	0
20	1675		110	0	0
25	721	361	115	0	0
30	358		120	0	0
35	231	150	125	0	0
40	178		130	0	0
45	146	113	135	0	0
50	114		140	0	0
55	65	63	145	0	0
60	46		150	0	0
65	32	29	155	0	0
70	8		160	0	0
75	1	2	165	0	0
80	1		170	0	0
85	0	0	175	0	0
90	0		180	0	0

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	2897	N / A	89.0
0-40	3048	N / A	93.6
0-60	3223	N / A	99.0
0-90	3255	N / A	100.0
40-90	208	N / A	6.4
60-90	32	N / A	1.0
90-180	0	N / A	0.0
0-180	3255	N / A	100.0

Total Light Output = 3,255 lm

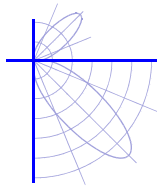
Signed:

Ryder Tunney

Ryder Tunney
Authorized Signatory

Date of test 19-Oct-2016

Date of report 24-Oct-2016



Test Report No. LLI-16282-12

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Nine LEDs mounted in circular array to white PCB with clear plastic array of individual lenses.

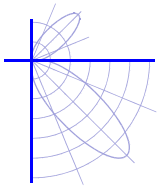
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Operating at 120 VAC and 60 Hz.

Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	20570		90.0	0	
2.5	19592		92.5	0	
5.0	16966	1363	95.0	0	
7.5	13245		97.5	0	0
10.0	9416		100.0	0	
12.5	6269		102.5	0	
15.0	4035	1174	105.0	0	
17.5	2586		107.5	0	0
20.0	1675		110.0	0	
22.5	1093		112.5	0	
25.0	721	361	115.0	0	
27.5	492		117.5	0	0
30.0	358		120.0	0	
32.5	278		122.5	0	
35.0	231	150	125.0	0	
37.5	200		127.5	0	0
40.0	178		130.0	0	
42.5	163		132.5	0	
45.0	146	113	135.0	0	
47.5	130		137.5	0	0
50.0	114		140.0	0	
52.5	90		142.5	0	
55.0	65	63	145.0	0	
57.5	51		147.5	0	0
60.0	46		150.0	0	
62.5	41		152.5	0	
65.0	32	29	155.0	0	
67.5	19		157.5	0	0
70.0	8		160.0	0	
72.5	3		162.5	0	
75.0	1	2	165.0	0	
77.5	1		167.5	0	0
80.0	1		170.0	0	
82.5	0		172.5	0	
85.0	0	0	175.0	0	
87.5	0		177.5	0	0
90.0	0		180.0	0	



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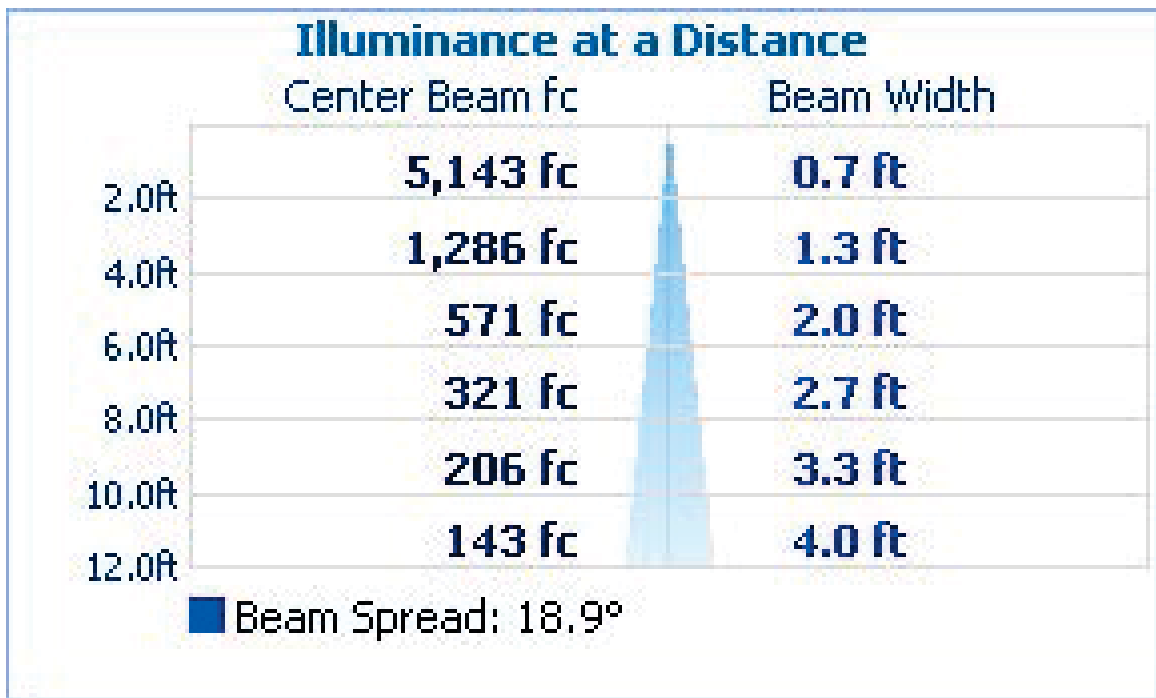
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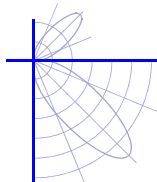
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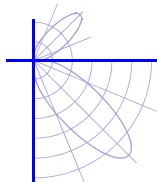
LM-79 Performance Data

Spectral	CIE 1931 (x, y) ⁽¹⁾	(0.435, 0.397)
	CIE 1976 (u', v') ⁽¹⁾	(0.252, 0.518)
	Correlated Color Temperature (CCT) ⁽¹⁾	2980 K
	Color Spatial Uniformity ⁽²⁾	0.0029
	Color Rendering Index (Ra) ⁽¹⁾	81.6
	Special CRI 9 (R ₉) ^{(1),(3)}	9
	Distance from Planckian Locus (Duv) ^{(1),(3)}	-0.0024
	Scotopic/Photopic Ratio ^{(1),(3)}	1.3

Electrical	Voltage	120 V	(Setpoint 1)
	Frequency	60 Hz	
	Current	0.427 A	
	Power	51.1 W	
	Power Factor	0.997	
	Current THD	2.43 %	
	Voltage	277 V	(Setpoint 2)
	Frequency	60 Hz	
	Current	0.223 A	
	Power	52.7 W	
Power Factor	0.854		
Current THD	11.29 %		

Performance data in accordance with IESNA LM-79-08. Spectral calculations are for a CIE 2° observer
Photometric and spectral values were measured at Setpoint 1

- (1) Value is computed from the weighted average of the spatial measurements
- (2) Value is the maximum deviation of the spatial u' and v' measurements from the weighted average
- (3) Quantity is in addition to the scope of IESNA LM-79-08



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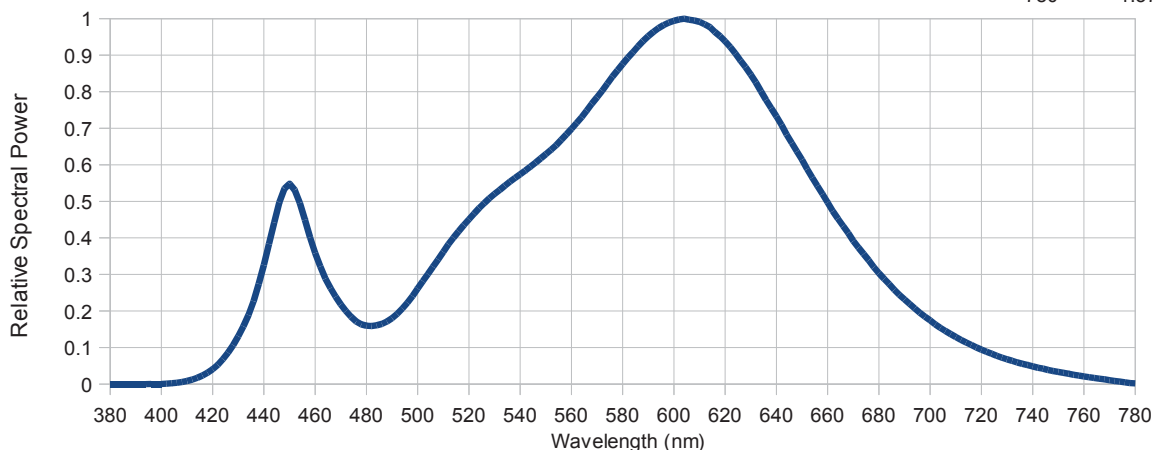
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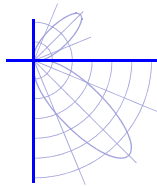
LM-79 Performance Data

Summary Relative Spectral Irradiance Distribution (wavelength – nm, irradiance – relative to peak = 1)

380	0.00E+00	480	1.60E-01	580	8.76E-01	680	3.03E-01
385	0.00E+00	485	1.62E-01	585	9.16E-01	685	2.66E-01
390	0.00E+00	490	1.80E-01	590	9.52E-01	690	2.31E-01
395	0.00E+00	495	2.15E-01	595	9.79E-01	695	2.01E-01
400	3.10E-04	500	2.61E-01	600	9.94E-01	700	1.74E-01
405	2.88E-03	505	3.11E-01	605	9.99E-01	705	1.49E-01
410	8.43E-03	510	3.61E-01	610	9.91E-01	710	1.28E-01
415	2.00E-02	515	4.09E-01	615	9.70E-01	715	1.10E-01
420	4.05E-02	520	4.51E-01	620	9.38E-01	720	9.39E-02
425	7.69E-02	525	4.88E-01	625	8.95E-01	725	8.02E-02
430	1.31E-01	530	5.21E-01	630	8.47E-01	730	6.80E-02
435	2.08E-01	535	5.48E-01	635	7.89E-01	735	5.71E-02
440	3.25E-01	540	5.74E-01	640	7.33E-01	740	4.83E-02
445	4.70E-01	545	6.00E-01	645	6.71E-01	745	4.03E-02
450	5.48E-01	550	6.29E-01	650	6.14E-01	750	3.31E-02
455	4.73E-01	555	6.61E-01	655	5.54E-01	755	2.67E-02
460	3.58E-01	560	6.98E-01	660	4.97E-01	760	2.09E-02
465	2.76E-01	565	7.40E-01	665	4.43E-01	765	1.55E-02
470	2.18E-01	570	7.85E-01	670	3.91E-01	770	1.05E-02
475	1.78E-01	575	8.31E-01	675	3.47E-01	775	5.68E-03
						780	1.57E-03



* The spectral power distribution combines the weighted spectral power distributions of all spatial measurements.



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LM-79 Performance Data

Spatial measurements

Vertical angle (deg)	CIE 1976 (u',v') coordinates	
	Horizontal 0 plane	Horizontal 90 plane
0	(0.254, 0.520)	(0.254, 0.520)
2	(0.254, 0.520)	(0.253, 0.520)
4	(0.253, 0.520)	(0.253, 0.520)
6	(0.253, 0.520)	(0.253, 0.519)
8	(0.253, 0.519)	(0.252, 0.519)
10	(0.252, 0.519)	(0.252, 0.519)
12	(0.252, 0.518)	(0.251, 0.518)
14	(0.251, 0.518)	(0.251, 0.517)
16	(0.251, 0.517)	(0.250, 0.517)
18	(0.251, 0.516)	(0.250, 0.516)

Spatial measurements

Vertical angle (deg)	CIE 1976 (u',v') coordinates	
	Horizontal 0 plane	Horizontal 90 plane
18	(0.251, 0.516)	(0.250, 0.516)
20	(0.250, 0.516)	I <= 10 %
22	I <= 10 %	I <= 10 %
24	I <= 10 %	I <= 10 %
26	I <= 10 %	I <= 10 %
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Test procedure

All measurements were performed in an environmentally controlled laboratory employing suitable baffling to minimize stray light. The sample was mounted in its normal operating orientation on a rotating mirror goniophotometer and operated from a stabilized supply. The photometric output was monitored and measurements were performed once stability was achieved.

The goniophotometer was used to measure the spatial distribution of both luminous intensity and, in conjunction with a spectroradiometer, spectral irradiance. The distribution locus comprises points in two or more planes (as indicated in the table above) at no more than 10° vertical intervals. The CIE (x,y) coordinates and other derived metrics (CIE (u', v'), CCT and CRI) are calculated from the weighted sum (weighted for intensity and represented solid angle) of the measured spectral irradiances.

Sample Orientation	Horizontal	Stabilization Time	4.75 hour
		Total Operation Time	17.25 hour

Equipment and uncertainties

LightLab International R80A C-gamma rotating mirror goniophotometer with a test distance of 8 m.

Luminous Intensity	± 4 %	Temperature	± 1 °C
Luminous Flux	± 4 %	Luminous Efficacy	± 4.5 %
Horizontal, Vertical Angles	± 0.25°		

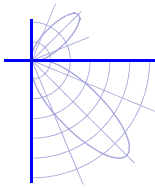
PhotoResearch PR-670 spectroradiometer (380 - 780 nm., 2 nm. per pixel) measuring at a distance from the sample deemed greater than five times the maximum observed luminous opening dimension.

CIE (x, y) coordinates	± 0.003	CCT	± 100 K
CIE (u', v') coordinates	± 0.002	CRI (Ra)	± 2
Δ (u', v') Color difference	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Relative Spectral Irradiance *	± 2 %	R9 *	± 2

Yokogawa WT210 power meter connected in circuit to the sample electrical supply

Voltage	± 0.5 %	Frequency *	± 0.1 Hz
Current	± 0.5 %	Power	± 0.5 %
Current THD *	± 3 %	Power Factor	± 0.02

This report contains data that are not covered by the NVLAP accreditation. Quantities marked with * are not covered.
IESNA LM-79-08 Calculator v5.1 (28th Jun 2016)



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Test Distance 8.0 m
Test Temperature 24.8 °C

Notes The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Tested in accordance with the applicable sections of publications: IES LM-79-08 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2011, ANSI C82.77:2002.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE Gamma coordinate system as defined in CIE publication number 121.

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This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.