

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014

Prepared For

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Project Number

DLF1811104

Data Number

DLF1811104-7a

Test Date

2018/11/7

Issue Date

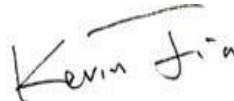
2018/11/8

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1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor - Mid Output Parking Garage Luminaire			
Requirement Category	Test Method	Requirements	Test value
Lamp Output (lm)	IES LM-79-2008	5000	5533
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	95	122.2
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	≥30%	39.86%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	≤25%	16.67%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	3062
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	71
Power Factor	ANSI C82.77:2014	0.873	0.953
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	13.46%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/7	IVGT5CU-50L730WU	G1
2	Goniophotometer Test	2018/11/7	IVGT5CU-50L730WU	G1
3	THD and PF Test	2018/11/7	IVGT5CU-50L730WU	G1

Remark(If any)

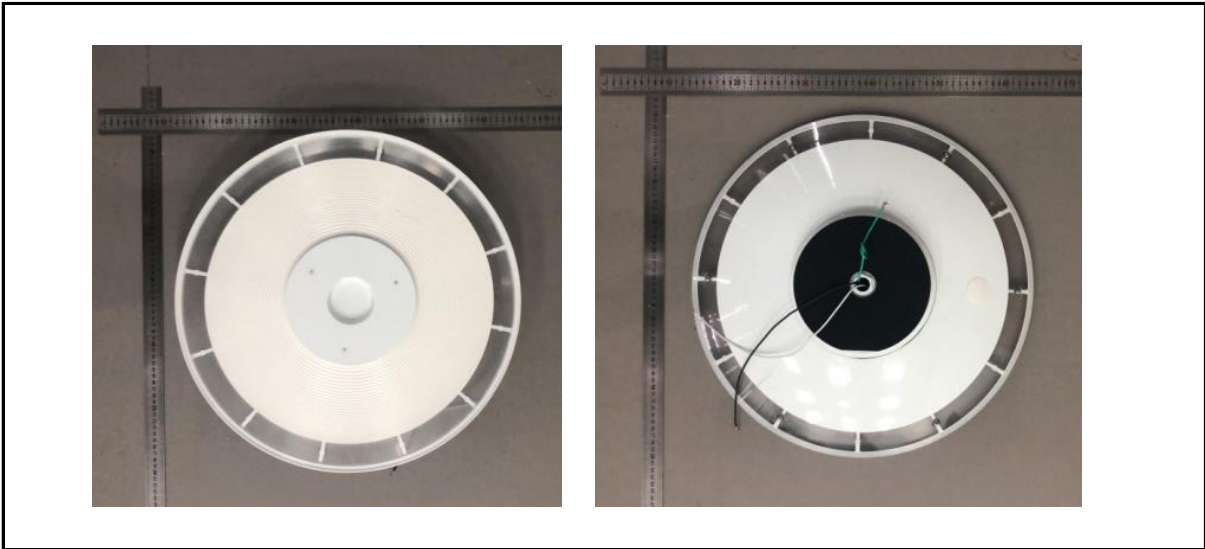
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3.0 Production Description

Luminaire Description: IVGT5CU-50L730WU

Electrical Specification: 120V-277V,50/60HZ, 50W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVGT5CU-50L730WU	Sample ID.	G1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Conditions

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.3	120.00	60	0.389	46.1	0.988

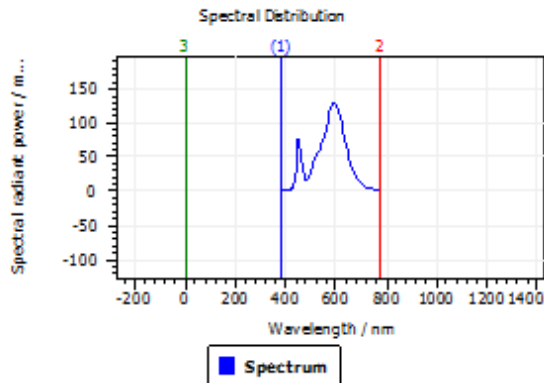
Test Result

CCT (K)	CRI (Ra)	Duv
3062	71.3	3.2E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

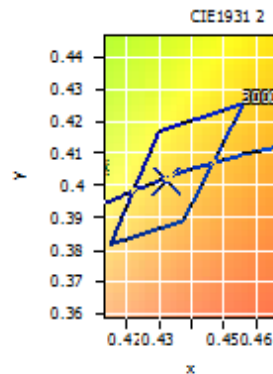
DominantWavelength	582.68 nm
Purity	0.502
PeakWavelength	593.02 nm
Radiant Power	17.03 W
Width50%:	103.01 nm

Color Coordinates

Correlated Color Temperatu 3062 K

x: 0.4321 u: 0.2485 u': 0.2485
y: 0.4016 v: 0.3465 v': 0.5197

ResultsCRICRI01	67.5	ResultsCRICRI09	-41.3
ResultsCRICRI02	84.2	ResultsCRICRI10	64.8
ResultsCRICRI03	93.5	ResultsCRICRI11	60.9
ResultsCRICRI04	65.4	ResultsCRICRI12	53.6
ResultsCRICRI05	67.3	ResultsCRICRI13	71.0
ResultsCRICRI06	78.7	ResultsCRICRI14	96.8
ResultsCRICRI07	75.0	ResultsCRICRI15	58.3
ResultsCRICRI08	39.0	ResultsCRICRI16	55.8
ResultsCRI	71.3		



PlanckDistance 3.2E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5CU-50L730WU	Sample ID.	G1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 10° horizontal intervals.

Test Conditions

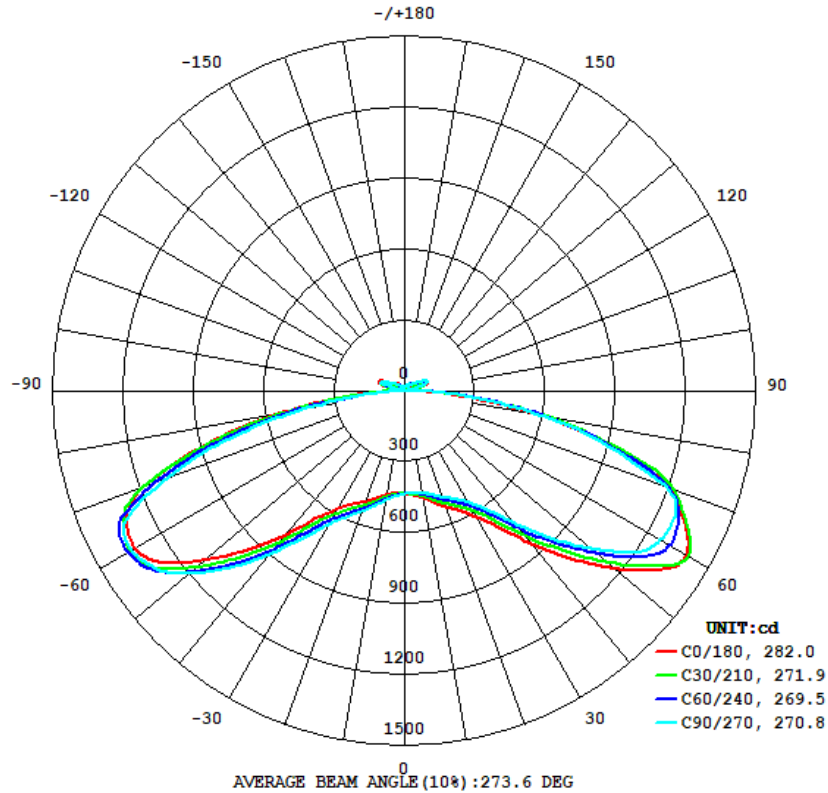
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.95	60	0.382	45.3	0.987	Light Down

Test Result

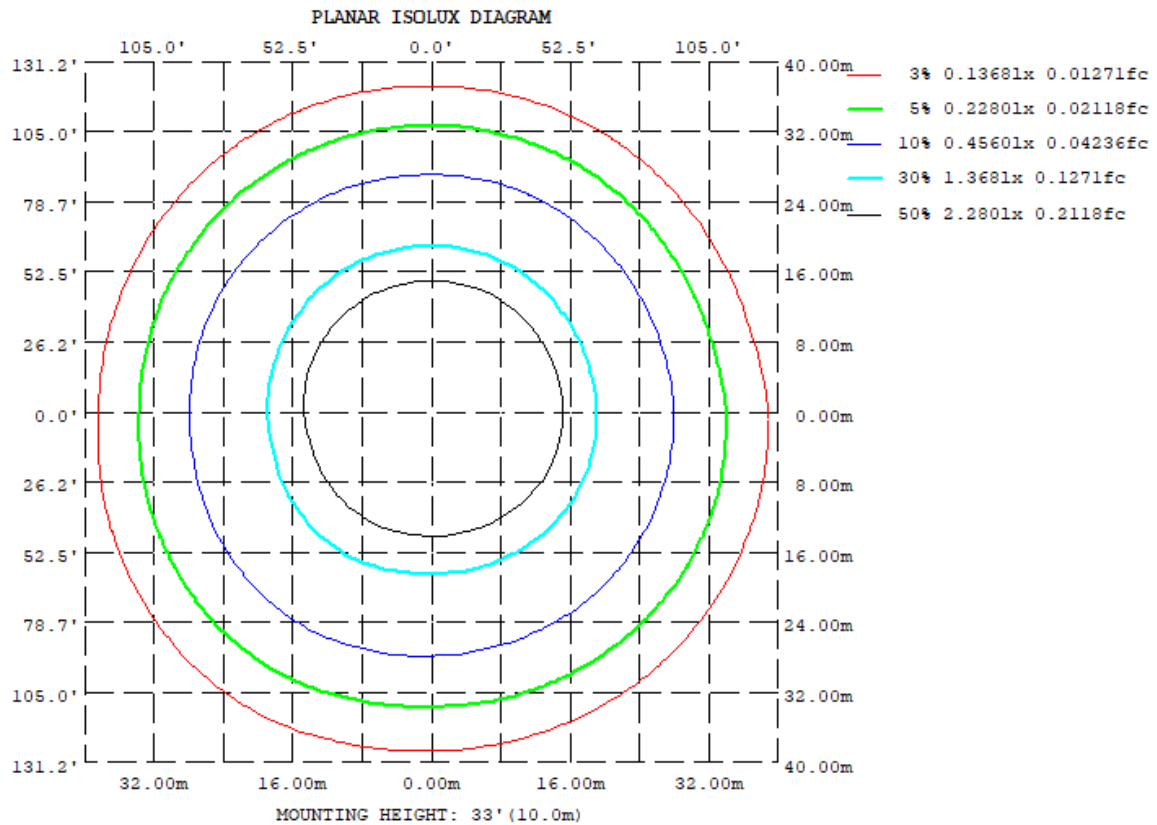
Flux (lm)	Zonal Lumen Requirement (60° - 80°)	Zonal Lumen Requirement (70° - 80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
5533	39.86%	16.67%	282.0	270.8	169.9	169	122.2

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd									
γ	C0	C45	C90	C135	C180	C225	C270	C315		
10	460.2	448.9	439.2	436.6	446.3	458.5	469.5	470.0		
20	524.4	499.5	480.1	476.7	499.4	522.3	540.9	545.4		
30	617.8	574.7	545.2	535.5	575.5	613.5	651.7	659.5		
40	844.1	776.0	733.1	721.5	792.4	854.2	900.0	908.0		
50	1169	1093	1038	1043	1112	1178	1204	1219		
60	1389	1353	1260	1336	1328	1362	1346	1351		
70	1203	1217	1184	1310	1191	1169	1075	1113		
80	575.0	603.4	579.2	654.5	529.6	489.1	428.7	461.3		
90	22.17	32.76	33.07	39.70	17.51	2.987	1.288	1.490		
100	15.43	22.49	22.49	28.60	15.35	42.82	43.28	40.32		
110	108.3	71.38	97.72	91.96	116.9	85.22	107.7	70.89		
120	82.68	78.77	86.07	66.29	77.81	59.89	73.10	74.36		
130	32.34	55.78	54.81	55.60	32.26	51.33	49.71	56.26		
140	45.68	39.14	38.72	41.38	45.44	36.11	35.32	38.61		
150	25.63	26.38	29.24	31.38	28.07	27.73	28.39	29.17		
160	20.07	21.22	24.78	22.16	20.35	20.54	22.80	22.72		
170	13.73	15.76	17.40	14.70	13.66	14.37	17.94	17.16		
180	13.97	13.38	12.51	13.91	13.31	13.34	11.83	13.01		

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	42.43	0 - 10	42.43	0.77%
10-20	136.99	0 - 20	179.42	3.24%
20-30	255.47	0 - 30	434.89	7.86%
30-40	438.32	0 - 40	873.21	15.78%
40-50	755.67	0 - 50	1628.88	29.44%
50-60	1129.06	0 - 60	2757.94	49.85%
60-70	1283.05	0 - 70	4040.99	73.03%
70-80	922.18	0 - 80	4963.17	89.70%
80-90	269.17	0 - 90	5232.34	94.57%
90-100	17.79	0 - 100	5250.13	94.89%
100-110	66.41	0 - 110	5316.54	96.09%
110-120	89.77	0 - 120	5406.31	97.71%
120-130	52.40	0 - 130	5458.71	98.66%
130-140	35.03	0 - 140	5493.74	99.29%
140-150	20.86	0 - 150	5514.60	99.67%
150-160	11.56	0 - 160	5526.16	99.88%
160-170	5.56	0 - 170	5531.72	99.98%
170-180	1.30	0 - 180	5533.02	100.00%

3.2 Goniophotometer Test

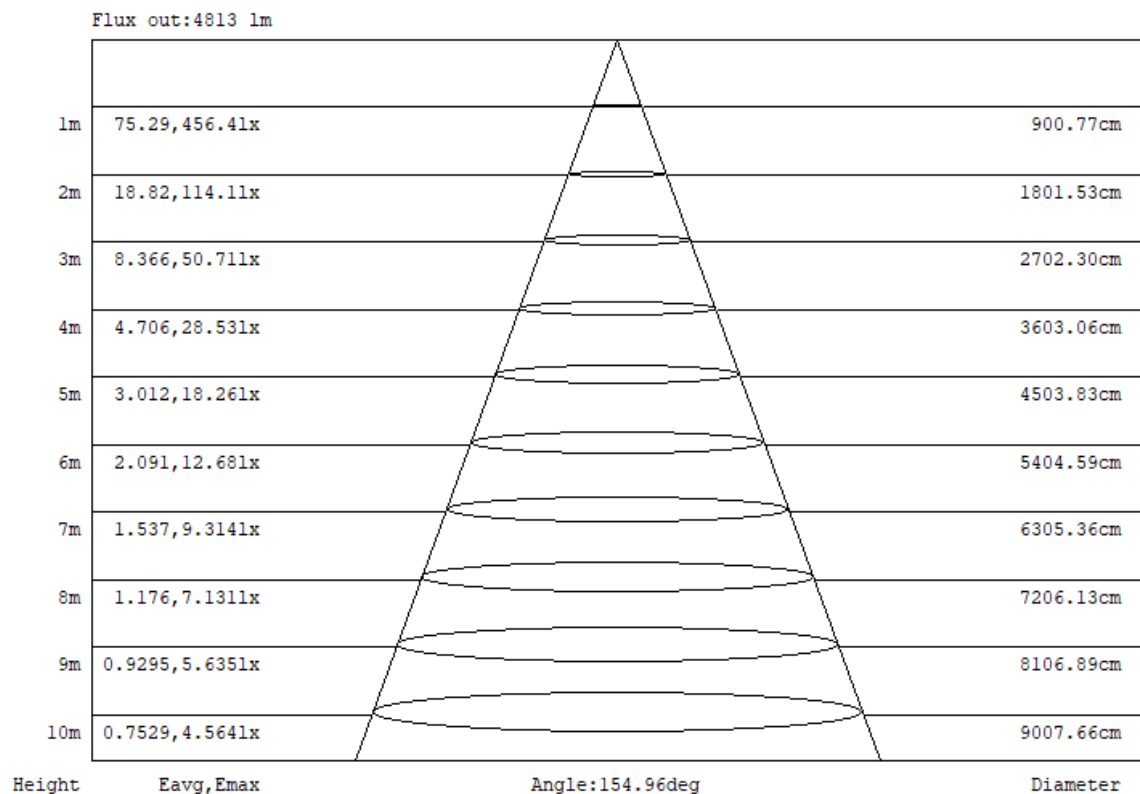
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
Rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	114	114	114	114	108	108	108	102	102	102	97	97	97	95
1	103	96	90	85	99	93	88	83	88	83	79	83	79	76	78	75	72	70
2	90	79	70	62	87	76	68	61	72	65	59	67	61	56	63	58	54	51
3	80	66	55	47	76	64	54	46	60	51	44	56	49	43	52	46	41	38
4	71	56	45	36	68	54	44	36	51	42	35	47	40	33	44	38	32	29
5	64	48	37	29	61	47	36	29	44	35	28	41	33	27	38	31	26	23
6	58	42	31	24	56	41	31	23	38	29	23	36	28	22	34	27	21	19
7	53	37	27	20	51	36	26	19	34	25	19	32	24	18	30	23	18	15
8	49	33	24	17	47	32	23	17	31	22	16	29	21	16	27	20	15	13
9	46	30	21	14	44	29	20	14	28	20	14	26	19	13	25	18	13	11
10	42	28	19	13	41	27	18	12	25	17	12	24	17	12	23	16	11	9

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5CU-50L730WU	Sample ID.	G1
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Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
25.1	277.02	60	0.171	45.2	0.953	13.46%
25.1	120.00	60	0.389	46.1	0.988	13.54%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration	Calibration Due Date
DLF107	Integrating Sphere System	2017/12/28	2018/12/27
DLF108	Auxiliary Lamp	2017/12/28	2018/12/27
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2017/12/28	2018/12/27
DLF116	AC Power Source	2017/12/28	2018/12/27
DLF113	Power Meter	2017/12/28	2018/12/27
DLF112	Temperature Recorder	2017/12/28	2018/12/27
DLF114	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF101	Goniophotometer	2017/12/28	2018/12/27
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2017/12/28	2018/12/27
DLF104	AC Power Source	2017/12/28	2018/12/27
DLF507	DC Power Source	2017/12/28	2018/12/27
DLF102	Power Meter	2017/12/28	2018/12/27
DLF111	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF119	Power Meter	2017/12/28	2018/12/27
DLF031	Temperature data logger	2017/12/28	2018/12/27
DLF022	Digital power meter	2017/12/28	2018/12/27
DLF003	Temperature & Humidity Datalogger	2017/12/28	2018/12/27

***** End of Test Report*****