

Photometric Test Report

Relevant Standards

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

Prepared For

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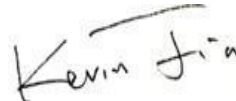
2018/11/12

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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	5368
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	95	121.0
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	≥30%	35.23%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	≤25%	14.23%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	3055
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	72
Power Factor	ANSI C82.77:2014	0.873	0.950
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	13.37%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/9	IVGT5C-50L730ZU	F1
2	Goniophotometer Test	2018/11/9	IVGT5C-50L730ZU	F1
3	THD and PF Test	2018/11/9	IVGT5C-50L730ZU	F1

Remark(If any)

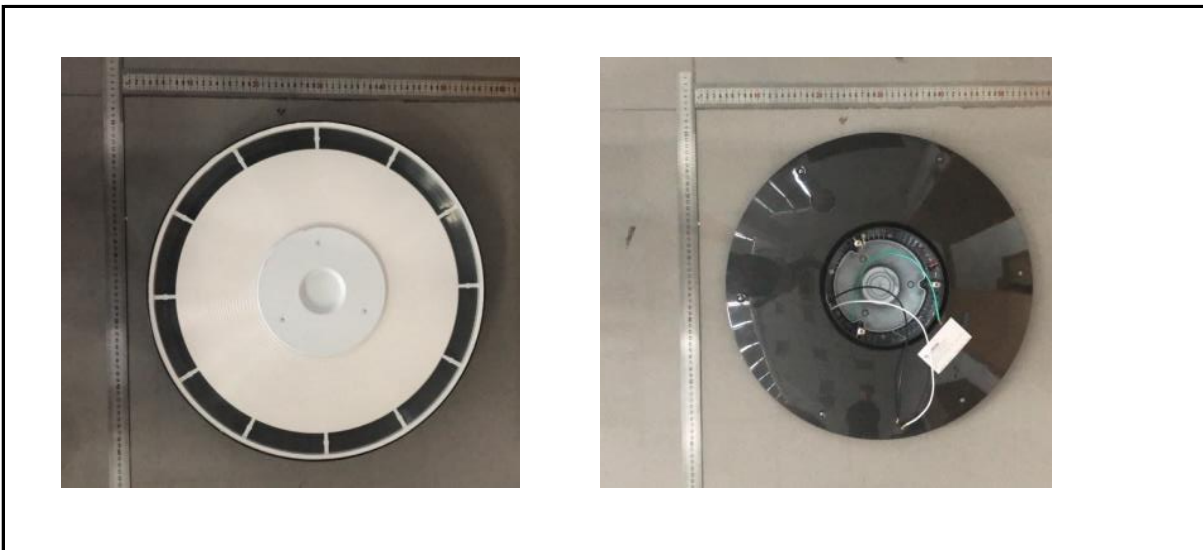
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3.0 Production Description

Luminaire Description: IVGT5C-50L730ZU

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.	IVGT5C-50L730ZU	Sample ID.	F1
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	120.01	60	0.379	44.9	0.988

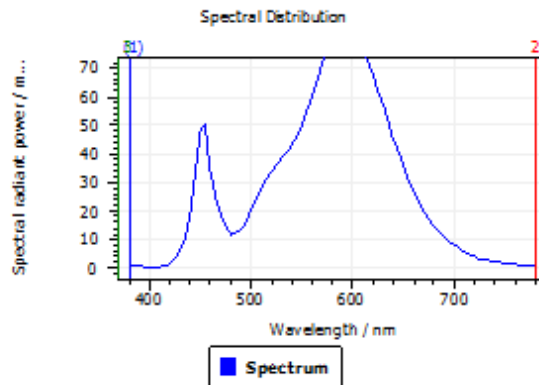
Test Result

CCT (K)	CRI (Ra)	Duv
3055	71.5	2.9E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

DominantWavelength	582.70 nm
Purity	0.505
PeakWavelength	593.09 nm
Radiant Power	11.34 W
Width50%:	103.05 nm

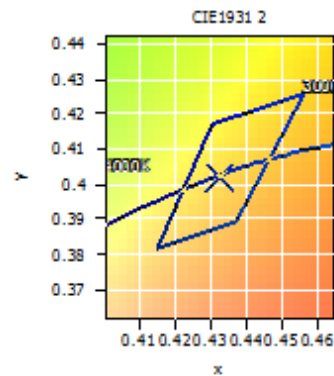
Color Coordinates

Correlated Color Temperatu 3055 K

x: 0.4327 u: 0.2488 u': 0.2488
y: 0.4018 v: 0.3466 v': 0.5199

ResultsCRICRI01	67.6	ResultsCRICRI09	-40.3
ResultsCRICRI02	84.3	ResultsCRICRI10	64.9
ResultsCRICRI03	93.6	ResultsCRICRI11	60.9
ResultsCRICRI04	65.5	ResultsCRICRI12	53.6
ResultsCRICRI05	67.5	ResultsCRICRI13	71.2
ResultsCRICRI06	78.8	ResultsCRICRI14	96.9
ResultsCRICRI07	75.2	ResultsCRICRI15	58.6
ResultsCRICRI08	39.4	ResultsCRICRI16	56.2

ResultsCRI 71.5



PlanckDistance 2.9E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5C-50L730ZU	Sample ID.	F1
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

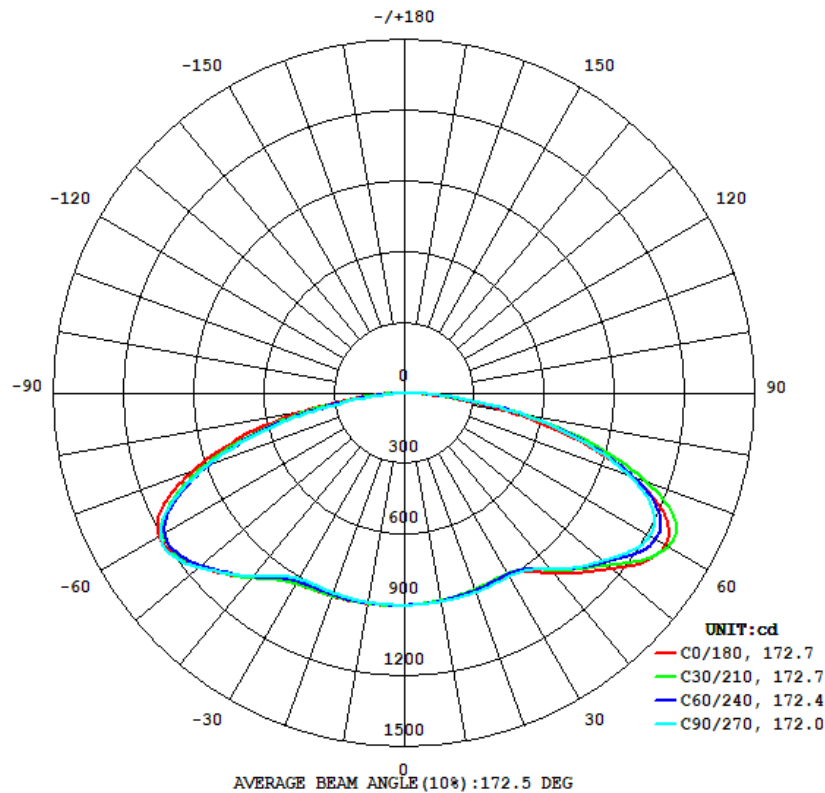
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.99	60	0.374	44.4	0.987	Light Down

Test Result

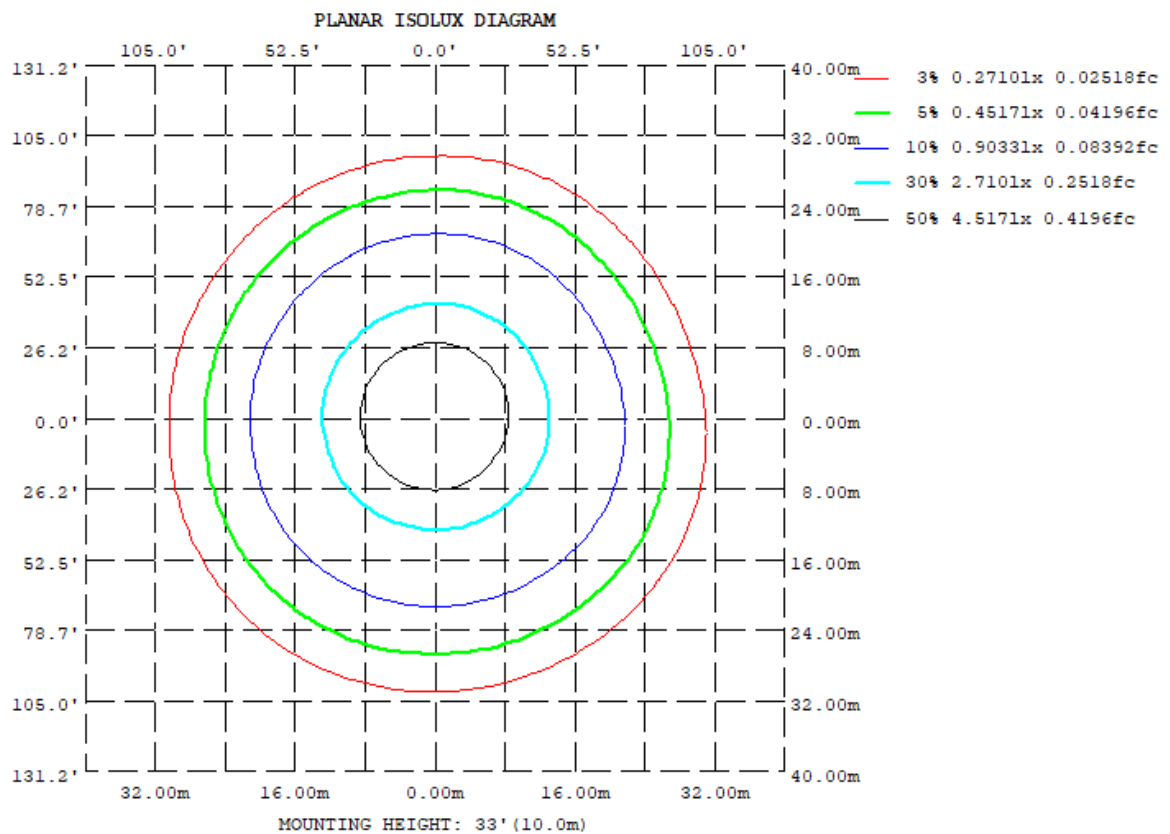
Flux (lm)	Zonal Lumen Requirement (60° - 80°)	Zonal Lumen Requirement (70° - 80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
5368	35.23%	14.23%	173.3	172.7	161	160.3	121.0

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	C0	C45	C90	C135	C180	C225	C270	C315
180	1.388	1.472	1.497	1.567	1.386	1.377	1.465	1.466
170	1.472	1.265	1.255	2.204	3.035	3.315	1.816	2.031
160	2.409	1.228	1.791	1.694	3.591	1.934	2.012	1.907
150	1.870	1.775	1.275	1.693	2.336	2.030	1.940	1.983
140	1.087	1.483	1.427	1.422	1.723	1.739	1.891	1.849
130	0.9186	1.284	1.296	1.129	1.476	1.553	1.662	1.470
120	0.8091	1.085	0.9951	0.9333	1.272	1.393	1.308	1.296
110	0.7331	0.8740	0.8897	0.7429	1.191	1.148	0.9990	0.9837
100	0.5261	0.5082	0.5182	0.5220	0.6960	0.7051	0.6519	0.6701
90	2.704	5.663	6.340	20.55	3.079	0.3173	0.1959	0.2088
80	456.8	506.1	503.2	532.0	436.7	376.8	338.0	362.4
70	1035	1074	1023	1052	964.4	904.4	900.2	931.4
60	1290	1266	1212	1233	1212	1185	1205	1240
50	1159	1123	1108	1128	1144	1140	1151	1169
40	1002	976.8	976.3	997.0	1024	1023	1016	1025
30	891.2	883.9	897.8	917.3	934.5	931.1	911.2	907.5
20	886.3	885.5	898.3	911.0	917.7	912.6	902.4	894.5
10	893.5	893.7	898.4	905.0	908.5	906.6	902.7	897.8
γ	C0	C45	C90	C135	C180	C225	C270	C315

LUMINOUS INTENSITY:cd

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	85.97	0 - 10	85.97	1.60%
10-20	255.37	0 - 20	341.34	6.36%
20-30	418.06	0 - 30	759.40	14.15%
30-40	596.94	0 - 40	1356.34	25.27%
40-50	832.22	0 - 50	2188.56	40.77%
50-60	1074.68	0 - 60	3263.24	60.79%
60-70	1127.46	0 - 70	4390.70	81.80%
70-80	763.68	0 - 80	5154.38	96.03%
80-90	204.58	0 - 90	5358.96	99.84%
90-100	1.81	0 - 100	5360.77	99.87%
100-110	0.82	0 - 110	5361.59	99.89%
110-120	1.03	0 - 120	5362.62	99.91%
120-130	1.20	0 - 130	5363.82	99.93%
130-140	1.14	0 - 140	5364.96	99.95%
140-150	1.08	0 - 150	5366.04	99.97%
150-160	0.90	0 - 160	5366.94	99.99%
160-170	0.53	0 - 170	5367.47	100.00%
170-180	0.17	0 - 180	5367.64	100.00%

3.2 Goniophotometer Test

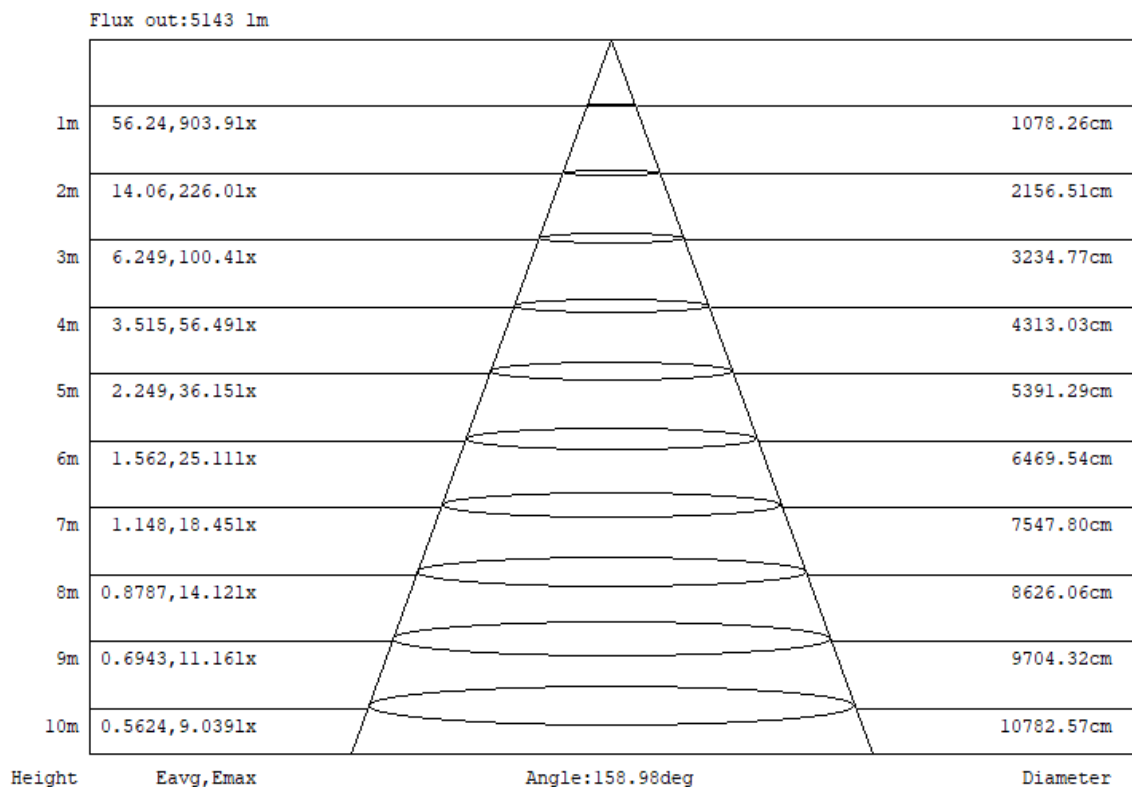
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
R/W	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	105	99	94	89	102	97	92	87	92	88	84	88	85	82	85	82	79	77
2	93	83	74	67	90	81	73	66	77	70	65	74	68	63	70	66	61	59
3	83	70	60	52	80	69	59	52	65	57	51	62	55	50	60	54	49	46
4	75	60	50	42	72	59	49	42	56	48	41	54	46	40	51	45	40	37
5	68	53	42	34	65	51	42	34	49	40	34	47	39	33	45	38	33	30
6	62	47	36	29	60	46	36	29	44	35	28	42	34	28	40	33	28	25
7	57	42	32	25	55	41	31	24	39	30	24	37	30	24	36	29	24	21
8	53	37	28	21	51	37	28	21	35	27	21	34	26	21	33	26	21	18
9	49	34	25	19	47	33	25	19	32	24	18	31	24	18	30	23	18	16
10	46	31	22	17	44	31	22	17	30	22	16	29	21	16	28	21	16	14

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5C-50L730ZU	Sample ID.	F1
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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	277.07	60	0.167	44.0	0.950	13.37%
25.1	120.01	60	0.379	44.9	0.988	13.55%

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-directional	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-directional	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*****