Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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Prepared By	**Approved By**
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1.0 Test Summary

DLC Technical Requirements v4.4

Outdoor - Mid Output Parking Garage Luminaire			
Requirement Category	**Test Method**	**Requirements**	**Test value**
Lamp Output (lm)	IES LM-79-2008	5000	7173
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	90	97.1
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	⩾30%	36.51%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	⩽25%	15.12%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	73.9
Input Voltage	IES LM-79-2008	Wrost Case	480
Input Current	IES LM-79-2008	Wrost Case	0.155
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	2979
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	71
Power Factor	ANSI C82.77:2014	0.873	0.995
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	9.17%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/12/14	IVGT5C-70L730Z4	J1
2	Goniophotometer Test	2018/12/14	IVGT5C-70L730Z4	J1
3	THD and PF Test	2018/12/14	IVGT5C-70L730Z4	J1

Remark(If any)
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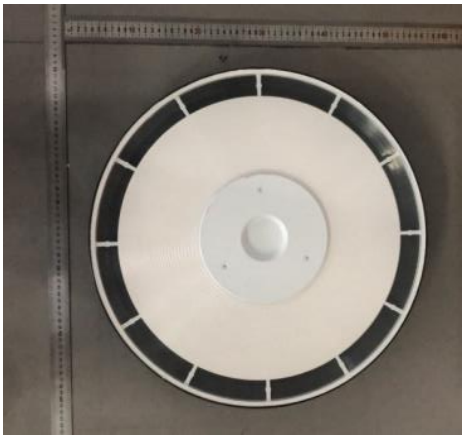
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

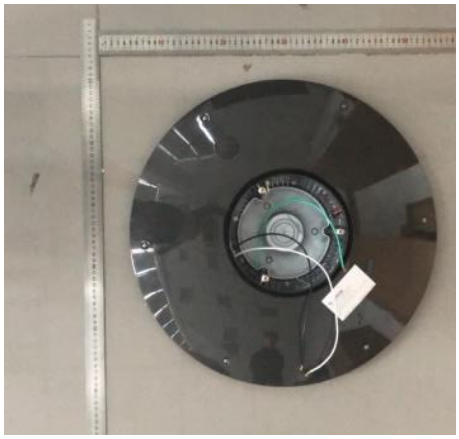
3.0 Production Description

Luminaire Description: IVGT5C-70L730Z4

Electrical Specification: 480V,50/60HZ, 70W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVGT5C-70L730Z4	Sample ID.	J1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008. Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º 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 (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.3	480	60	0.155	74.1	0.995

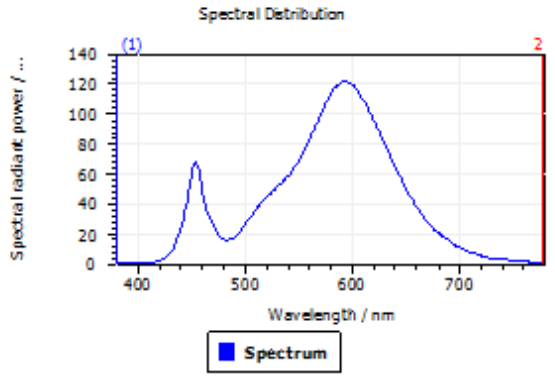
Test Result

CCT (K)	CRI (Ra)	Duv
2979	71.3	5.1E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

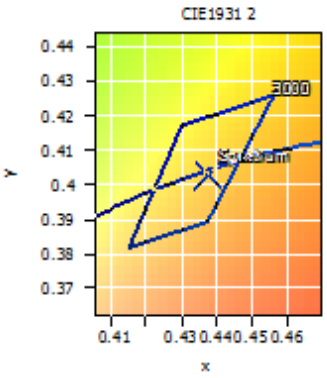
Spectral values

DominantWavelength	583.09 nm
Purity	0.523
PeakWavelength	593.37 nm
Width50%:	100.74 nm

Color Coordinates

Correlated Color Temperatu		2979 K			
x:	0.4376	u:	0.2515	u':	0.2515
y:	0.4030	v:	0.3474	v':	0.5211

CRI01	67.1	CRI09	-40.1
CRI02	83.8	CRI10	64.0
CRI03	94.1	CRI11	60.3
CRI04	65.5	CRI12	52.9
CRI05	67.3	CRI13	70.4
CRI06	78.3	CRI14	97.2
CRI07	75.0	CRI15	58.6
CRI08	39.2	CRI16	56.2
ResultsCRI	71.3		



PlanckDistance 5.1E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5C-70L730Z4	Sample ID.	J1
Opreate time (Min.)	90	Stabilization time (Min.	45

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° 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^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

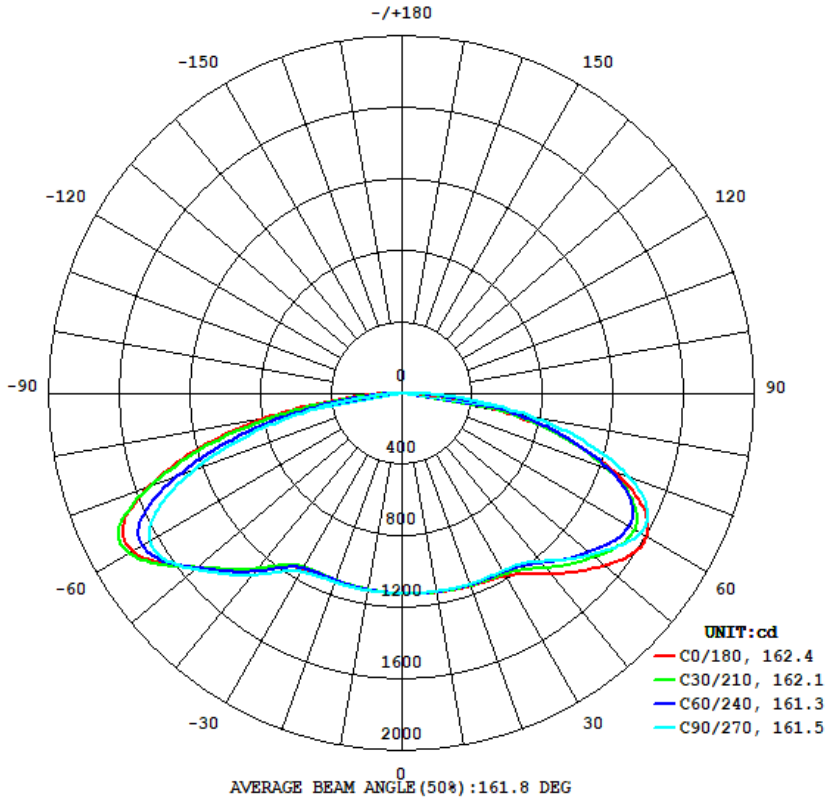
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	479.96	60	0.155	73.9	0.994	Light Down

Test Result

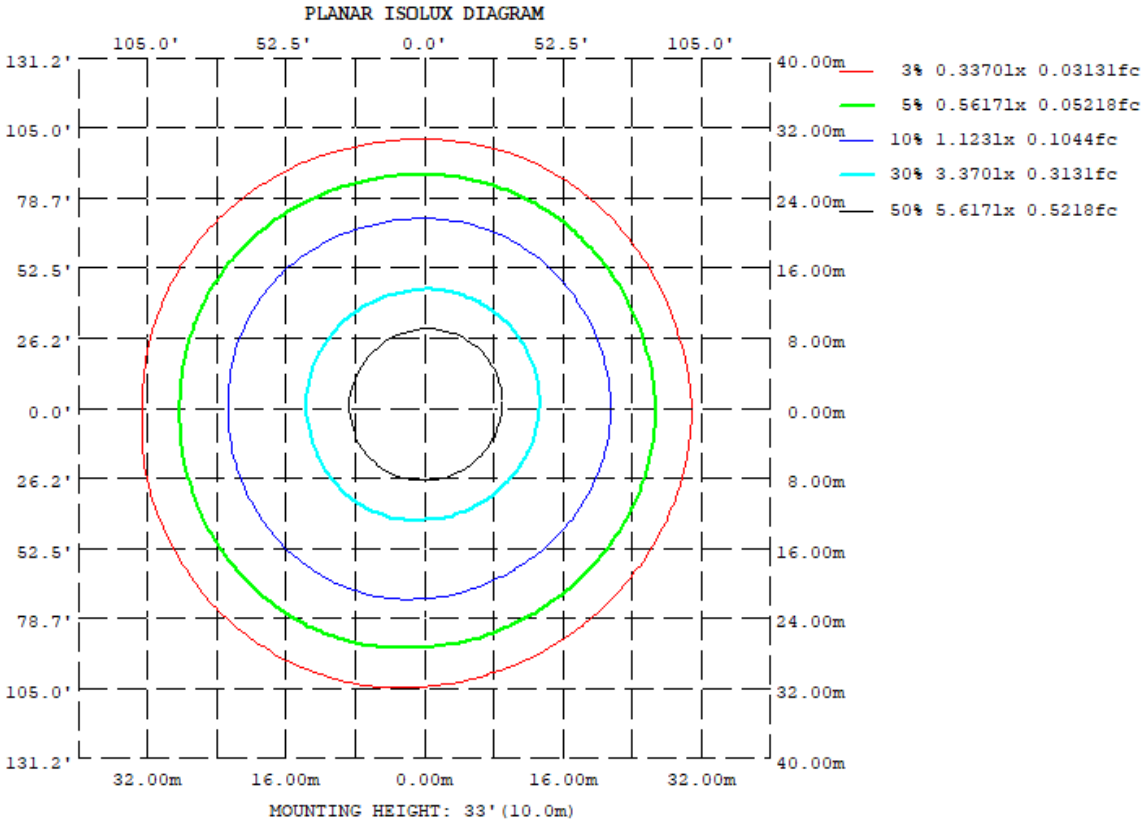
Flux (lm)	Zonal Lumen Requirement (60°-80°)	Zonal Lumen Requirement (70°-80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7173	36.51%	15.12%	174.3	173.7	162.4	161.5	97.1

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1132	1130	1127	1123	1119	1116	1122	1130
20	1148	1142	1136	1132	1121	1112	1126	1144
30	1182	1161	1146	1150	1136	1125	1154	1187
40	1321	1255	1230	1263	1280	1288	1329	1363
50	1498	1393	1403	1493	1519	1519	1534	1558
60	1603	1489	1562	1719	1763	1752	1649	1644
70	1277	1232	1374	1572	1530	1454	1259	1245
80	571.1	607.4	742.1	884.7	763.3	647.3	494.0	481.3
90	5.000	19.73	41.52	62.68	31.89	0.7585	0.3380	0.3821
100	0.8429	0.7757	0.7296	0.7215	0.6827	0.6873	0.6670	0.7389
110	1.095	1.118	0.9983	0.9684	1.119	1.108	1.142	1.088
120	1.198	1.292	1.229	1.157	1.378	1.515	1.383	1.425
130	1.353	1.480	1.516	1.353	1.773	1.765	1.715	1.623
140	1.426	1.655	1.708	1.639	2.136	2.119	2.167	2.042
150	1.567	1.722	1.705	1.828	2.579	2.640	2.520	2.651
160	2.317	1.690	1.741	1.830	3.220	2.489	2.760	2.465
170	1.937	1.619	1.653	1.970	2.442	2.030	2.242	2.931
180	1.824	1.952	1.970	1.942	1.825	1.848	1.968	1.981
DEG	LUMINOUS INTENSITY:cd							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	107.23	0 - 10	107.23	1.49%
10-20	319.98	0 - 20	427.21	5.96%
20-30	528.40	0 - 30	955.61	13.32%
30-40	762.90	0 - 40	1718.51	23.96%
40-50	1079.02	0 - 50	2797.53	39.00%
50-60	1419.60	0 - 60	4217.13	58.79%
60-70	1534.78	0 - 70	5751.91	80.19%
70-80	1084.23	0 - 80	6836.14	95.30%
80-90	322.69	0 - 90	7158.83	99.80%
90-100	6.18	0 - 100	7165.01	99.89%
100-110	0.96	0 - 110	7165.97	99.90%
110-120	1.19	0 - 120	7167.16	99.92%
120-130	1.31	0 - 130	7168.47	99.94%
130-140	1.33	0 - 140	7169.80	99.96%
140-150	1.26	0 - 150	7171.06	99.97%
150-160	1.04	0 - 160	7172.10	99.99%
160-170	0.62	0 - 170	7172.72	100.00%
170-180	0.21	0 - 180	7172.93	100.00%

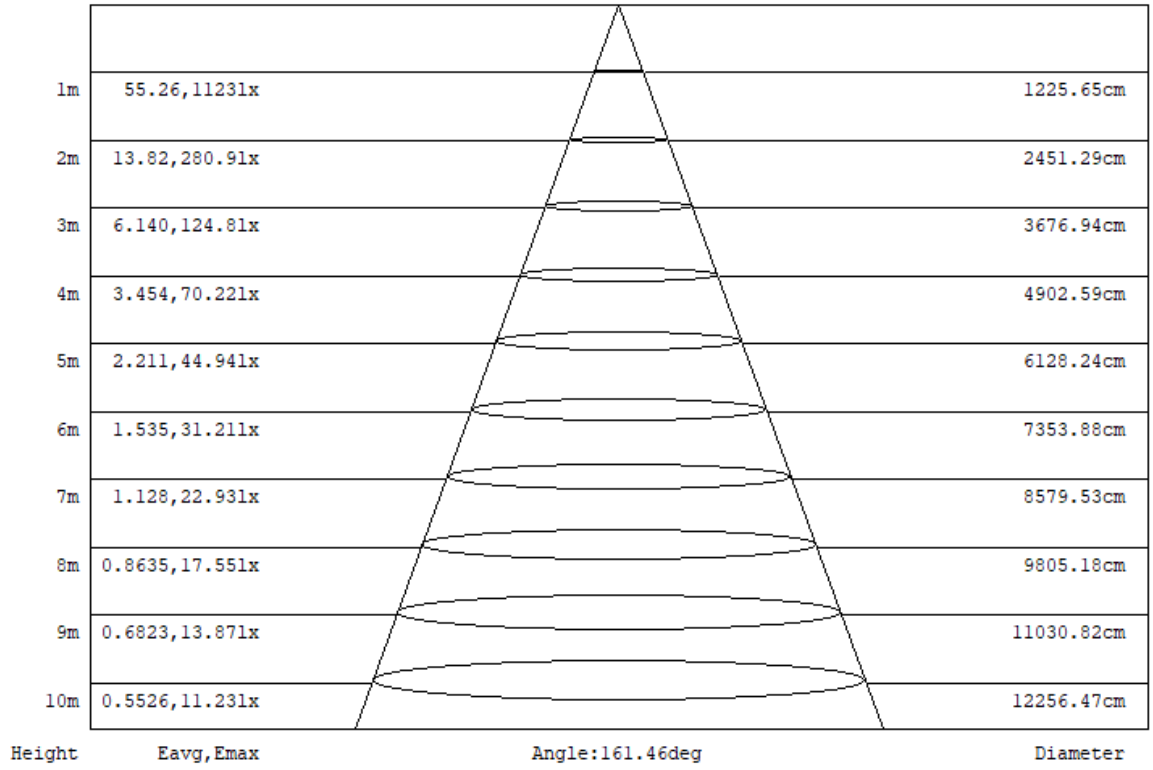
3.2 Goniophotometer Test

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	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	105	99	93	88	102	96	91	86	92	87	83	88	84	81	84	81	78	76
2	93	82	73	66	90	80	72	65	76	69	63	73	67	62	69	65	60	58
3	82	69	59	51	80	68	58	50	64	56	49	61	54	48	59	53	48	45
4	74	60	49	41	71	58	48	40	55	47	40	53	45	39	50	44	38	36
5	67	52	41	33	65	51	41	33	48	39	33	46	38	32	44	37	32	29
6	61	46	35	28	59	45	35	28	43	34	27	41	33	27	39	32	27	24
7	56	41	31	24	54	40	30	24	38	30	23	37	29	23	35	28	23	21
8	52	37	27	21	50	36	27	20	35	26	20	33	26	20	32	25	20	18
9	48	33	24	18	47	33	24	18	32	23	18	30	23	18	29	22	17	15
10	45	31	22	16	44	30	22	16	29	21	16	28	21	16	27	20	16	14

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5C-70L730Z4	Sample ID.	J1

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 25º C ± 1º 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	480	60	0.155	74.1	0.995	9.17%

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**********